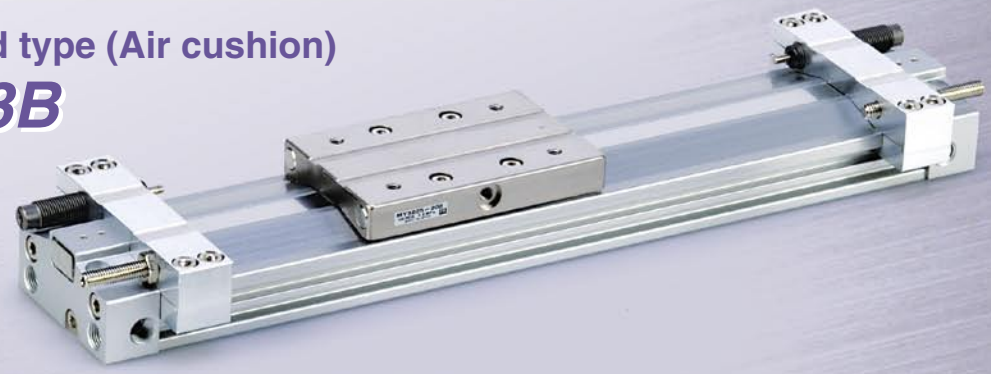
Mechanically Jointed Rodless Cylinders

Basic short type (Rubber bumper)
Series MY3A

Basic standard type (Air cushion)
Series MY3B



Slide bearing type (Air cushion)
Series MY3M

Series Variations

Series	Type	Piping type	Bore size (mm)				Rubber bumper	Air cushion	Stroke adjusting unit	Side support	Floating bracket	Made to Order
			16	25	40	63						
MY3A	Basic short type	Centralised piping Standard piping	●	●	●	●	●	●	●	●	●	Long stroke (-XB11) Helical insert threads (-X168) Holder mounting bracket Note) (-X416, X417) Copper-free (20-)
MY3B	Basic standard type		●	●	●	●	●	●	●	●	●	
MY3M	Slide bearing type		●	●	●	●	●	●	●	●	●	

Note) Except for MY3A

High functionality with reduced height and length

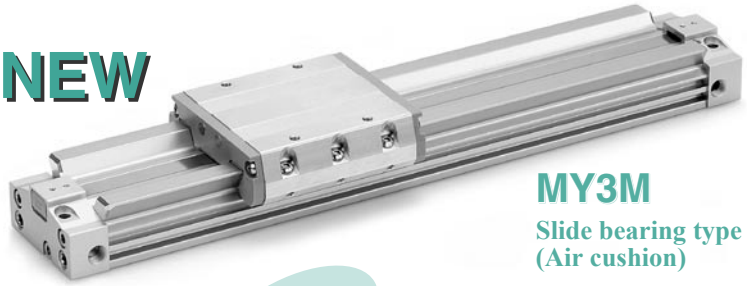
Mechanically Jointed Rodless Cylinders

Series MY3

MY3A
Basic short type
(Rubber bumper)

MY3B
Basic standard type
(Air cushion)

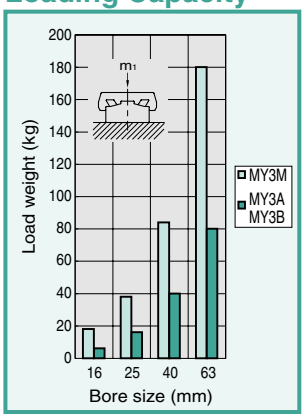
NEW

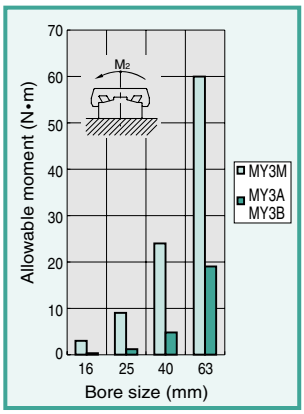


MY3M
Slide bearing type
(Air cushion)

Work pieces can be loaded directly onto the work table due to the integrated guide.

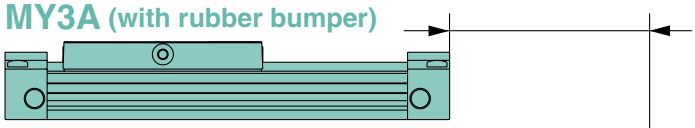
Loading Capacity



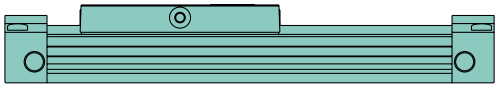


Overall length (Z) reduced by up to maximum of 140 mm

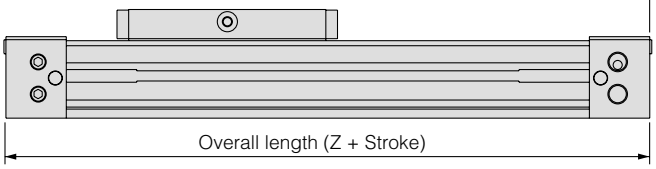
MY3A (with rubber bumper)



MY3B/MY3M (with air cushion)



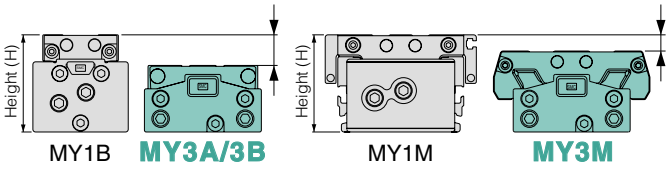
MY1B/MY1M (with air cushion)



Overall Length (Z) (mm)

Series	ø16	ø25	ø40	ø63
MY3A	**110**	**150**	**240**	**320**
MY3B MY3M	**122**	**178**	**276**	**356**
MY1B MY1M	160	220	340	460

Height (H) reduced by up to a maximum of 36%



Height (H) (mm)

Series	ø16	ø25	ø40	ø63
MY3A MY3B	**27**	**37**	**54**	**84**
MY1B	37	54	84	116
MY3M	**33**	**45**	**63**	**93**
MY1M	40	54	84	130

Weight reduced by up to a maximum of 53%

Weight (kg)

Series	ø16	ø25	ø40	ø63
MY3A	**0.34**	**0.99**	**2.95**	**8.26**
MY3B	**0.35**	**1.09**	**3.08**	**8.99**
MY1B	0.73	1.57	4.41	14.5
MY3M	**0.45**	**1.32**	**3.65**	**9.99**
MY1M	0.91	2.12	7.00	18.9

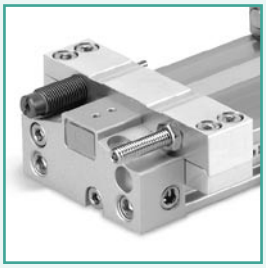
∗ At 100 mm stroke

Floating Bracket

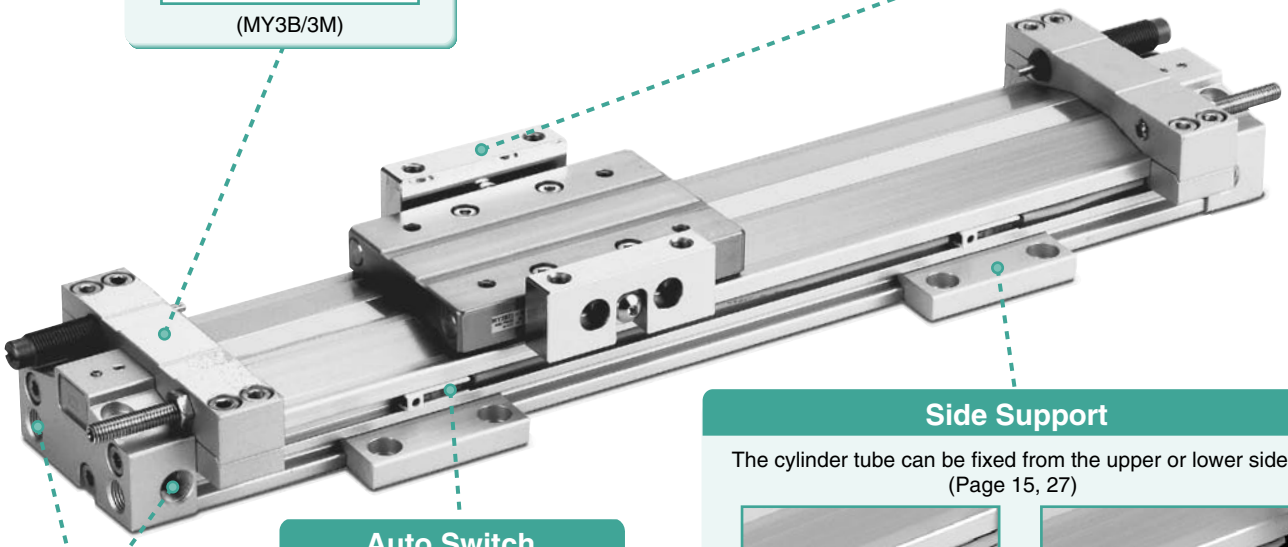
Easy connection with external guide. Vertical and lateral mounting is possible. (Page 16)

(MY3A/3B)

Stroke Adjusting Unit

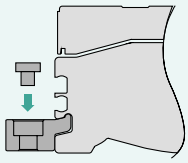


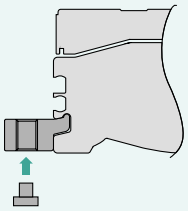
(MY3B/3M)



Side Support

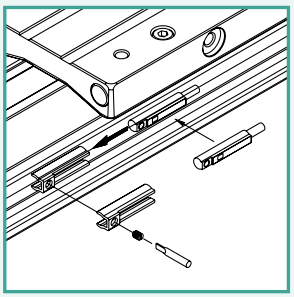
The cylinder tube can be fixed from the upper or lower side. (Page 15, 27)





Auto Switch

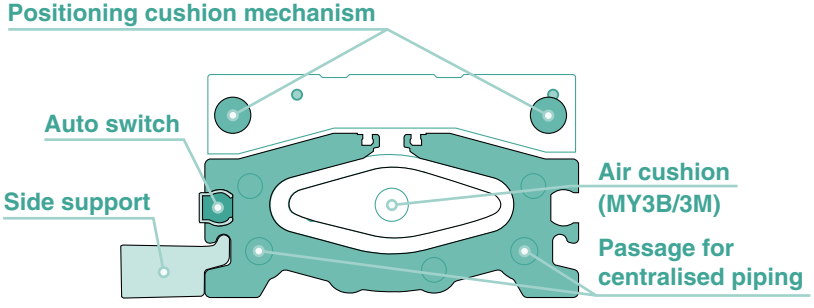
Can be mounted on both sides from the front direction.



Centralised Piping

Integrated piping in the head cover is possible. (Refer to back page 6.)

The uniquely designed piston shape enables reduction of the height and length as well as practical arrangement of the common piping passages, cushion mechanism and positioning mechanism. This has achieved drastic miniaturisation and weight reduction.



Series MY3
Model Selection 1

The following are steps for selecting the MY3 series which is best suited to your application.

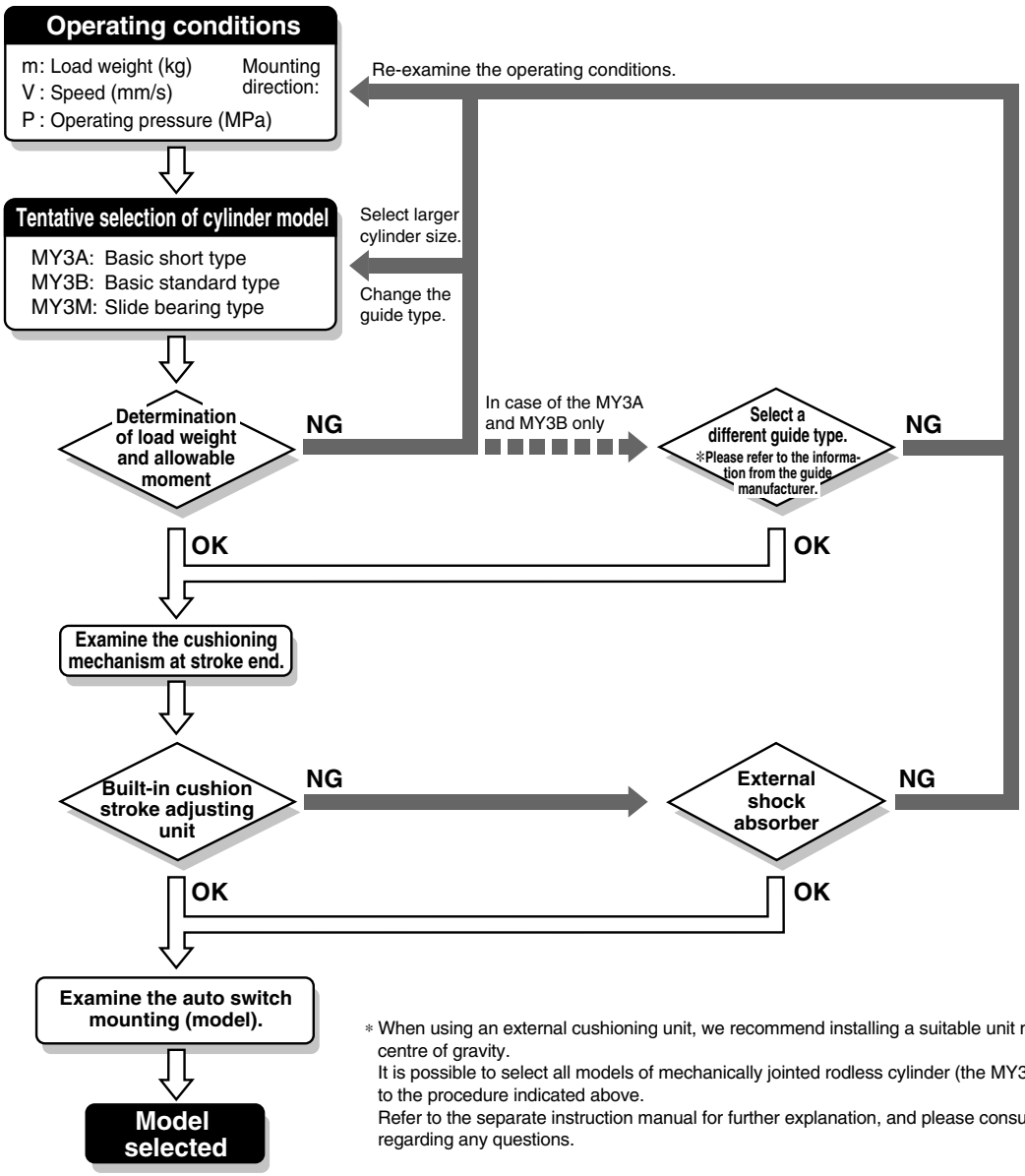
Guideline for a Tentative Model Selection

Series	Type	Guideline for a tentative model selection				Note
		Stroke accuracy	Use of external guide	Direct loaded	Table accuracy	
MY3A	Basic short type	△	◎	△	△	Generally combined with a separare guide making it, by length, more compact.
MY3B	Basic standard type	◎	◎	○	△	Generally combined with a separare guide, when stroke accuracy is required.
MY3M	Slide bearing type	◎	×	◎	○	When mounting a work piece directly on the product, when stroke accuracy is

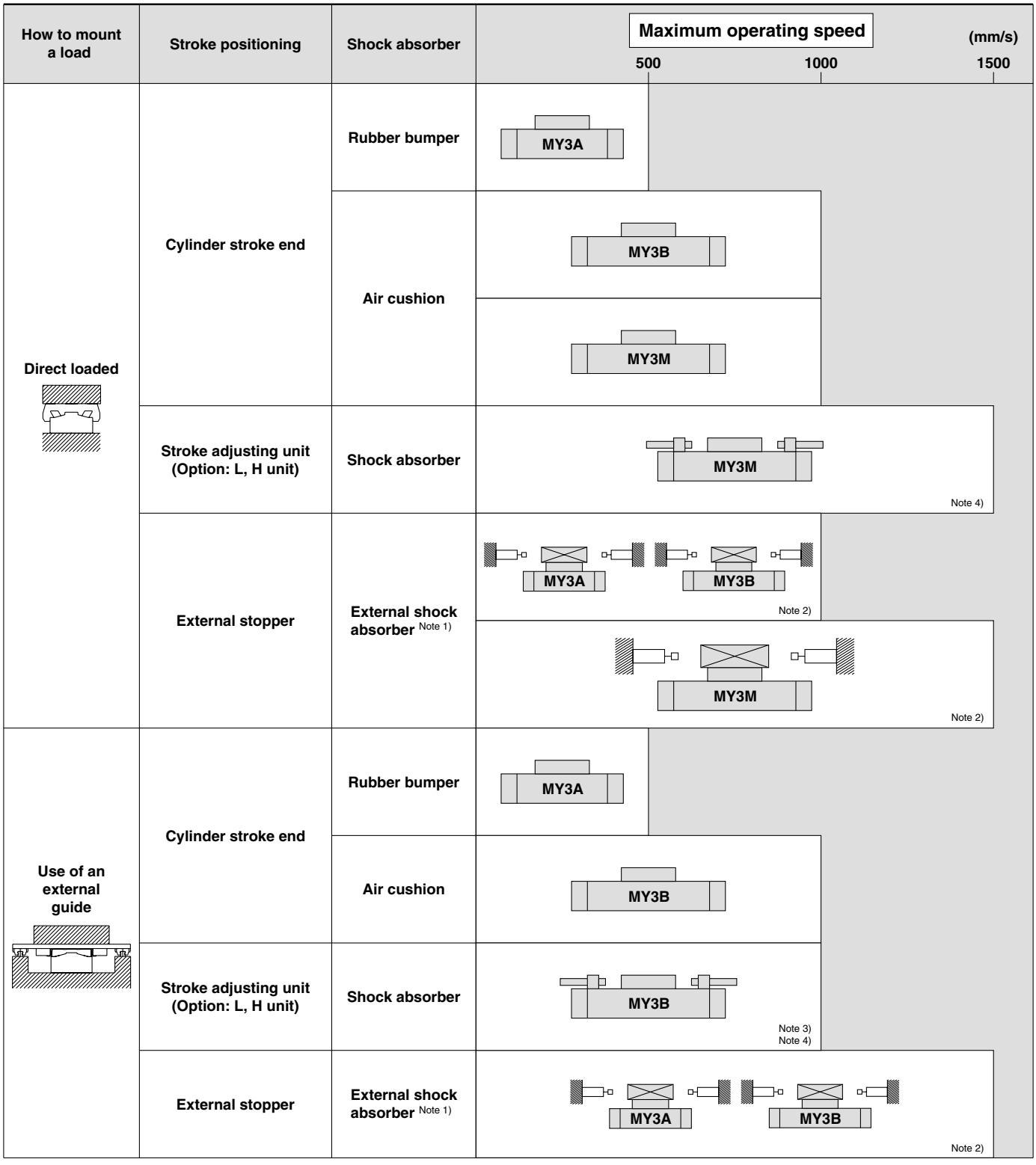
◎ Most suitable ○ Suitable △ Usable × Not recommended
Note) The table accuracy means the amount of table deflection when a moment is applied.

Selection Flow Chart

When an external guide is used, the selection confirmation of the guide capacity should follow the selection procedure of the external guide.
The MY3 series allows direct load application within the allowable range for the built-in guide. The payload in this case will vary depending on the driving speed and the mounting orientation of the cylinder. Please refer to the selection flow chart below and confirm the selection. (For a more detailed description of the selection flow, please refer to the instruction manual.)



＊ When using an external cushioning unit, we recommend installing a suitable unit near the load's centre of gravity.
It is possible to select all models of mechanically jointed rodless cylinder (the MY3 series) according to the procedure indicated above.
Refer to the separate instruction manual for further explanation, and please consult with SMC regarding any questions.



Note 1) The shock absorber must meet the conditions mentioned on page 7.
Note 2) For the external shock absorber, a unit with appropriate capacity and features should be installed close to the load's centre of gravity.
Note 3) Use the stroke adjusting unit of the MY3B series with an external guide.
Note 4) Shown below are the details of the maximum operating speed for the stroke adjusting unit.

MY3 Series, Maximum Operating Speed when Using the Stroke Adjusting Unit

Unit: mm/s

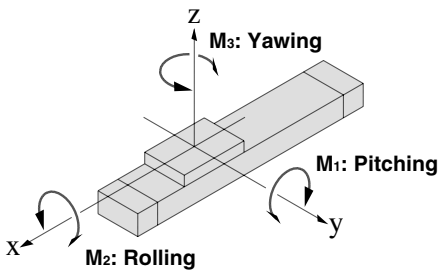
Series	Bore size (mm)	Stroke adjustment range	Inside the fine stroke adjustment range	Outside the fine stroke adjustment range
MY3B	16	L unit	800	500
		H unit	1000	800
	25, 40, 63	L, H unit	1000	800
MY3M	16, 25, 40, 63	L, H unit	1500	800

Outside the fine stroke adjustment range means that a holder mounting bracket (X416, X417) is used.
Holder mounting bracket → Refer to page 34, 35.

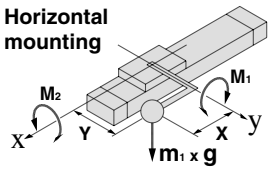
Types of Moment Applied to Rodless Cylinders

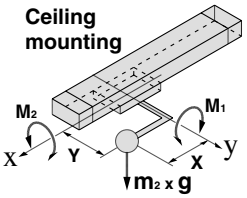
Multiple moments may be generated depending on the mounting orientation, load and position of the centre of gravity.

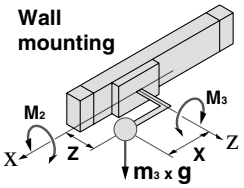
Coordinates and Moments

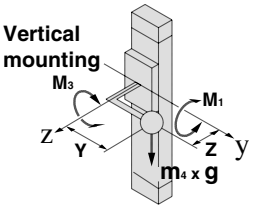


Load Weight and Static Moment







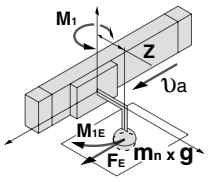


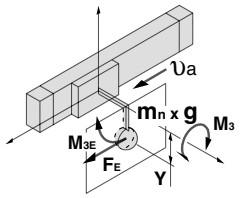
g: Gravitational acceleration

Mounting direction		Horizontal	Ceiling	Wall	Vertical
Static load m		m_1	m_2	m_3	m_4 Note)
Static moment	M_1	$m_1 \times g \times X$	$m_2 \times g \times X$	—	$m_4 \times g \times Z$
	M_2	$m_1 \times g \times Y$	$m_2 \times g \times Y$	$m_3 \times g \times Z$	—
	M_3	—	—	$m_3 \times g \times X$	$m_4 \times g \times Y$

Note) m_4 is a mass movable by thrust. Use 0.3 to 0.7 times the thrust (differs depending on the operating speed) as a guide for actual use.

Dynamic Moment





g : Gravitational acceleration
υa: Average speed
δ : Bumper coefficient

Mounting direction		Horizontal	Ceiling	Wall	Vertical
Dynamic load F_E		$1.4\upsilon a \times \delta \times m_n \times g$			
Dynamic moment	M_{1E}	$\frac{1}{3} \times F_E \times Z$			
	M_{2E}	Dynamic moment M_{2E} will not be generated.			
	M_{3E}	$\frac{1}{3} \times F_E \times Y$			

Note) Regardless of the mounting orientation, dynamic moment is calculated with the formulae above.

Calculation of Guide Load Factor

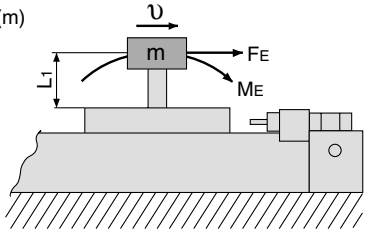
1. Maximum load weight (1), static moment (2), and dynamic moment (3) (at the time of impact with stopper) must be examined for the selection calculations.
   * To evaluate, use υa (average speed) for (1) and (2), and υ (impact speed $\upsilon = 1.4\upsilon a$) for (3). Calculate m max for (2) from the maximum allowable load graph (m_1, m_2, m_3) and Mmax for (2) and (3) from the maximum allowable moment graph (M_1, M_2, M_3).

Sum of guide load factors

$$\Sigma\alpha = \frac{\text{Load weight [m]}}{\text{Maximum load weight [m max]}} + \frac{\text{Static moment [M]}^{\text{Note 1)}}}{\text{Allowable static moment [Mmax]}} + \frac{\text{Dynamic moment [M}_E\text{]}^{\text{Note 2)}}}{\text{Allowable dynamic moment [M}_E\text{max]}} \leqq 1$$

Note 1) Moment caused by the load, etc., with cylinder in resting condition.
Note 2) Moment caused by the impact load equivalent at the stroke end (at the time of impact with stopper).
Note 3) Depending on the shape of the work piece, multiple moments may occur. When this happens, the sum of the load factors ($\Sigma\alpha$) is the total of all such moments.

2. Reference formulas [Dynamic moment at impact]
   Use the following formulas to calculate dynamic moment when taking stopper impact into consideration.
   - m : Load weight (kg)
   - F : Load (N)
   - F_E : Load equivalent to impact (at impact with stopper) (N)
   - υa : Average speed (mm/s)
   - M : Static moment (N·m)
   - υ : Impact speed (mm/s)
   - L_1 : Distance to the load's centre of gravity (m)
   - M_E : Dynamic moment (N·m)
   - δ : Bumper coefficient
     With rubber bumper = 4/100
     With air cushion = 1/100
     With shock absorber = 1/100
   - g : Gravitational acceleration (9.8 m/s²)



$\upsilon = 1.4\upsilon a$ (mm/s) $\quad F_E = 1.4\upsilon a \times \delta^{\text{Note 4)}} \times m \cdot g$

$$\therefore M_E = \frac{1}{3}^{\text{Note 5)}} \cdot F_E \cdot L_1 = 4.57\upsilon a \delta m L_1 \text{ (N·m)}$$

Note 4) $1.4\upsilon a\delta$ is a dimension less coefficient for calculating impact force.
Note 5) Average load coefficient = $\left(\frac{1}{3}\right)$:
This coefficient is for averaging the maximum load moment at the time of stopper impact according to service life calculations.

3. For detailed selection procedure, please refer to pages 2, 3, 18, 19.

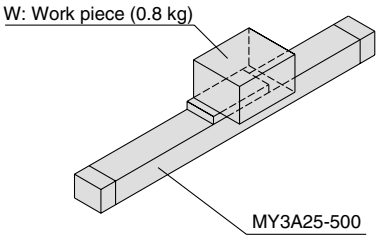
Model Selection 2

The following are steps for selecting the MY3 series which is best suited to your application.

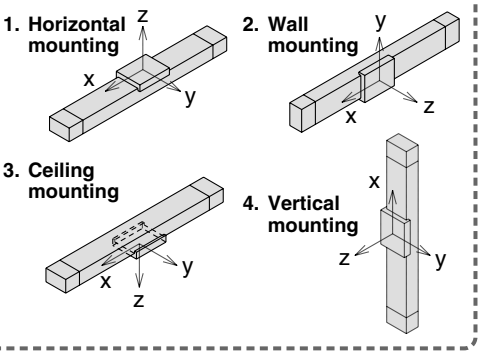
Calculation of a Guide Load Factor

1 Operating Conditions

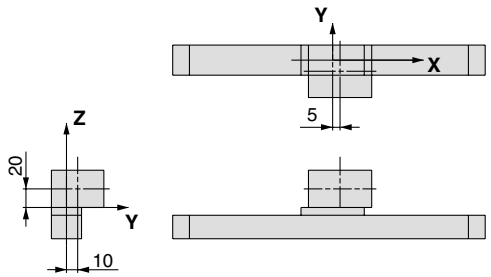
Cylinder ····· MY3A25-500
Average operating speed υa ····· 300 mm/s
Mounting direction ····· Horizontal mounting
Cushion ····· Rubber bumper (δ = 4/100)



Mounting Direction



2 Load Blocking



Work Piece Weight and Centre of Gravity

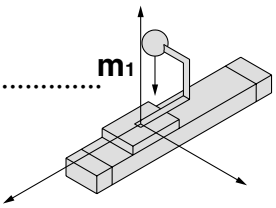
Work piece no.	Weight (m)	Centre of gravity		
		X-axis	Y-axis	Z-axis
W	0.8 kg	5 mm	10 mm	20 mm

3 Calculation of Load Factor for Static Load

m_1: Mass

m_1 max (from ① of graph MY3A/m_1) = 10.7 (kg) ·····

Load factor $\alpha_1 = m_1 / m_1$ max = 0.8/10.7 = **0.08**

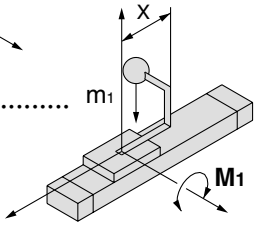


M_1: Moment

M_1 max (from ② of graph MY3A/M_1) = 4 (N•m) ·····

$M_1 = m_1 \times g \times X = 0.8 \times 9.8 \times 5 \times 10^{-3} = 0.04$ (N•m)

Load factor $\alpha_2 = M_1 / M_1$ max = 0.04/4 = **0.01**

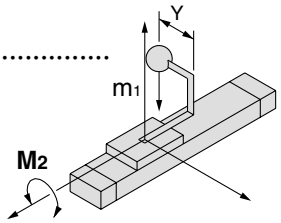


M_2: Moment

M_2 max (from ③ of graph MY3A/M_2) = 0.8 (N•m) ·····

$M_3 = m_1 \times g \times Y = 0.8 \times 9.8 \times 10 \times 10^{-3} = 0.08$ (N•m)

Load factor $\alpha_3 = M_2 / M_2$ max = 0.08/0.8 = **0.1**

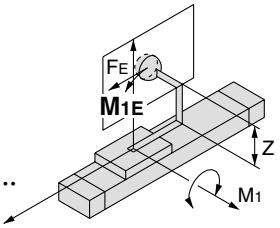


Calculation of Guide Load Factor

4 Calculation of Load Factor for Dynamic Moment

Equivalent load F_E at impact

$F_E = 1.4\upsilon a \times \delta \times m \times g = 1.4 \times 300 \times \frac{4}{100} \times 0.8 \times 9.8 = 131.7$ (N)

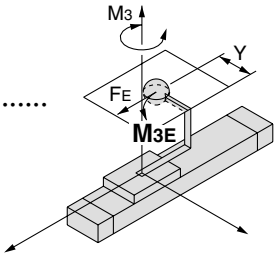


M_{1E}: Moment

M_{1E} max (from ④ of graph MY3A/M_1 where $1.4\upsilon a$ = 420 mm/s) = 2.85 (N•m) .....

$M_{1E} = \frac{1}{3} \times F_E \times Z = \frac{1}{3} \times 131.7 \times 20 \times 10^{-3} = 0.88$ (N•m)

Load factor $\alpha_4 = M_{1E}/M_{1E}$ max = 0.88/2.85 = **0.31**



M_{3E}: Moment

M_{3E} max (from ⑤ of graph MY3A/M_3 where $1.4\upsilon a$ = 420 mm/s) = 0.95 (N•m) .....

$M_{3E} = \frac{1}{3} \times F_E \times Y = \frac{1}{3} \times 131.7 \times 10 \times 10^{-3} = 0.44$ (N•m)

Load factor $\alpha_5 = M_{3E}/M_{3E}$ max = 0.44/0.95 = **0.43**

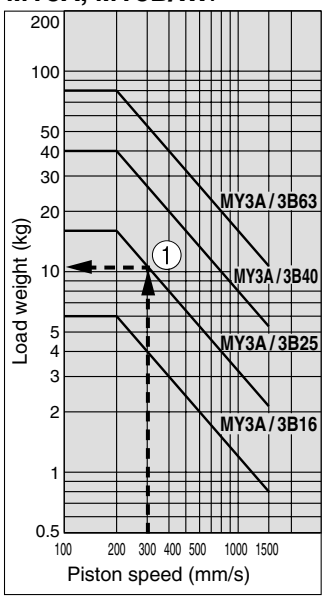
5 Sum and Examination of Guide Load Factors

$\Sigma\alpha = \alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 + \alpha_5 = 0.08 + 0.01 + 0.1 + 0.31 + 0.43 = 0.93 \leq 1$

The above calculation is within the allowable value, and therefore the selected model can be used.
Select a shock absorber separately.
In an actual calculation, when the sum of guide load factors $\Sigma\alpha$ in the formula above is more than 1, consider decreasing the speed, increasing the bore size, or changing the product series.

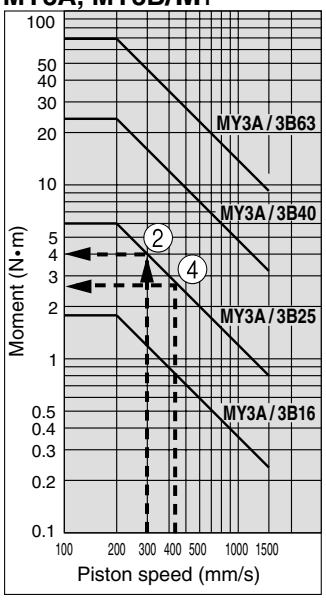
Load Weight

MY3A, MY3B/m_1

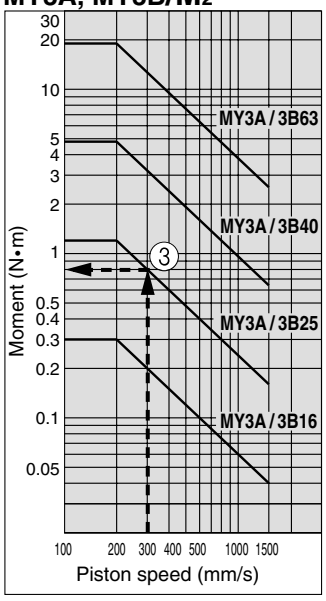


Allowable Moment

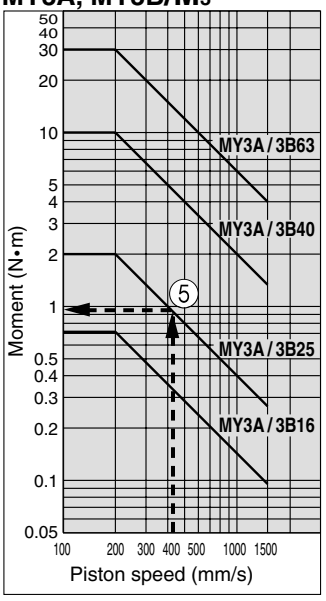
MY3A, MY3B/M_1



MY3A, MY3B/M_2



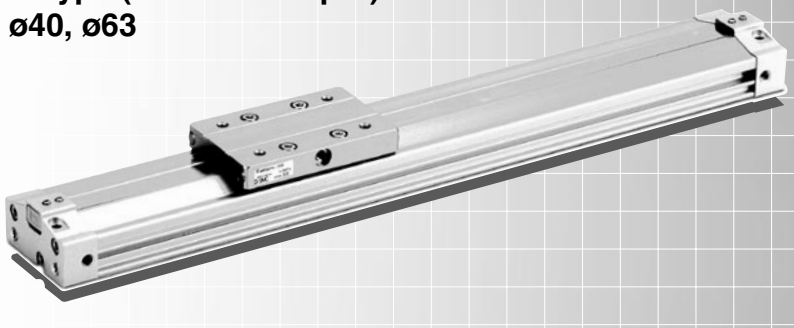
MY3A, MY3B/M_3



∗ Refer to page 18 for the MY3M.

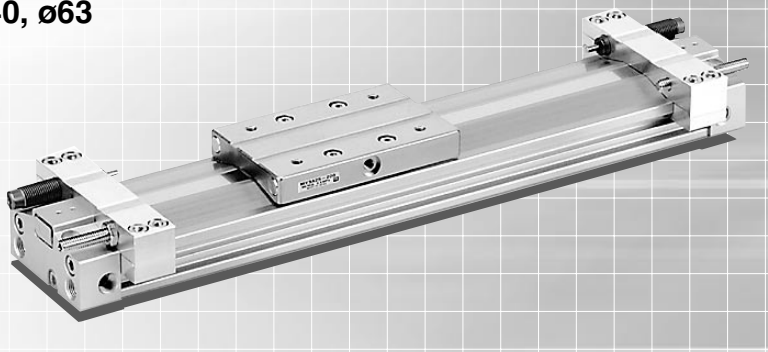
Series MY3A

Basic short type (Rubber bumper)
ø16, ø25, ø40, ø63



Series MY3B

Basic standard type (Air cushion)
ø16, ø25, ø40, ø63



Series MY3A/3B

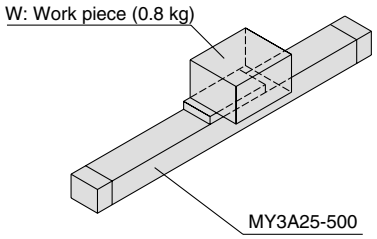
Model Selection

The following are steps for selecting the MY3A/3B series which is best suited to your application.

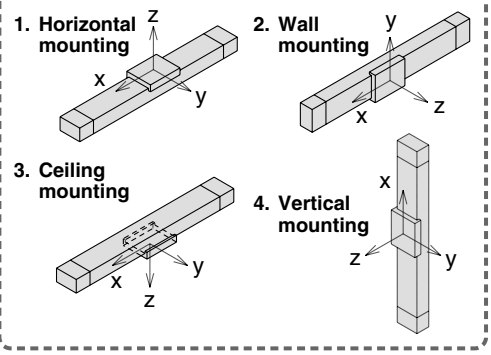
Calculation of Guide Load Factor

1 Operating Conditions

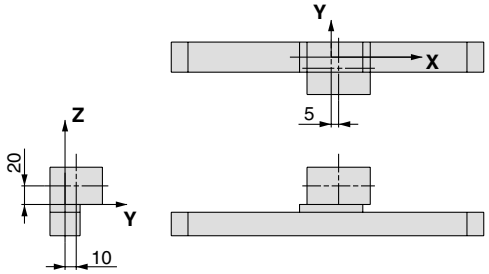
Cylinder ····· **MY3A25-500**
Average operating speed υa ····· **300 mm/s**
Mounting direction ····· **Horizontal mounting**
Cushion ····· **Rubber bumper (δ = 4/100)**



Mounting Direction



2 Load Blocking



Work Piece Weight and Centre of Gravity

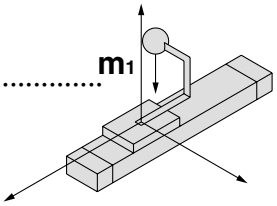
Work piece no.	Mass (m)	Centre of gravity		
		X-axis	Y-axis	Z-axis
W	0.8 kg	5 mm	10 mm	20 mm

3 Calculation of Load Factor for Static Load

m_1: Mass

m_1 max (from ① of graph MY3A/m_1) = 10.7 (kg) ·····

Load factor $\alpha_1 = m_1/m_1$ max = 0.8/10.7 = **0.08**

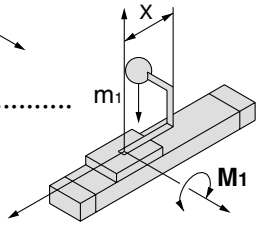


M_1: Moment

M_1 max (from ② of graph MY3A/M_1) = 4 (N•m) ·····

$M_1 = m_1 \times g \times X = 0.8 \times 9.8 \times 5 \times 10^{-3} = 0.04$ (N•m)

Load factor $\alpha_2 = M_1/M_1$ max = 0.04/4 = **0.01**

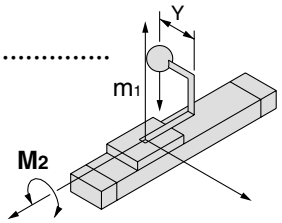


M_2: Moment

M_2 max (from ③ of graph MY3A/M_2) = 0.8 (N•m) ·····

$M_3 = m_1 \times g \times Y = 0.8 \times 9.8 \times 10 \times 10^{-3} = 0.08$ (N•m)

Load factor $\alpha_3 = M_2/M_2$ max = 0.08/0.8 = **0.1**

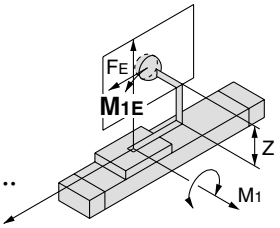


Calculation of Guide Load Factor

4 Calculation of Load Factor for Dynamic Moment

Equivalent load F_E at impact

$F_E = 1.4\upsilon a \times \delta \times m \times g = 1.4 \times 300 \times \frac{4}{100} \times 0.8 \times 9.8 = 131.7$ (N)

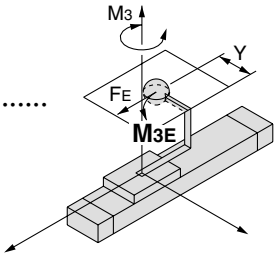


M_{1E}: Moment

M_{1E} max (from ④ of graph MY3A/M_1 where $1.4\upsilon a$ = 420 mm/s) = 2.85 (N•m) .....

$M_{1E} = \frac{1}{3} \times F_E \times Z = \frac{1}{3} \times 131.7 \times 20 \times 10^{-3} = 0.88$ (N•m)

Load factor $\alpha_4 = M_{1E}/M_{1E}$ max = 0.88/2.85 = **0.31**



M_{3E}: Moment

M_{3E} max (from ⑤ of graph MY3A/M_3 where $1.4\upsilon a$ = 420 mm/s) = 0.95 (N•m) .....

$M_{3E} = \frac{1}{3} \times F_E \times Y = \frac{1}{3} \times 131.7 \times 10 \times 10^{-3} = 0.44$ (N•m)

Load factor $\alpha_5 = M_{3E}/M_{3E}$ max = 0.44/0.95 = **0.43**

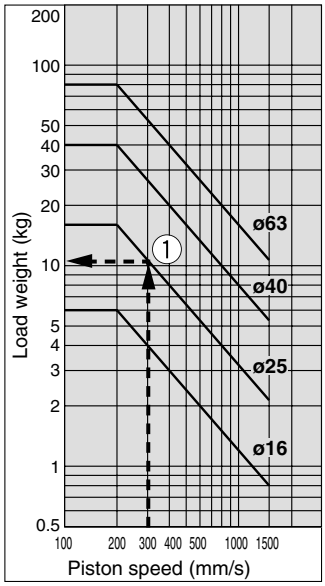
5 Sum and Examination of Guide Load Factors

$\Sigma\alpha = \alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 + \alpha_5 = 0.08 + 0.01 + 0.1 + 0.31 + 0.43 = 0.93 \leq 1$

The above calculation is within the allowable value, and therefore the selected model can be used.
Select a shock absorber separately.
In an actual calculation, when the sum of guide load factors $\Sigma\alpha$ in the formula above is more than 1, consider decreasing the speed, increasing the bore size, or changing the product series.

Load Weight

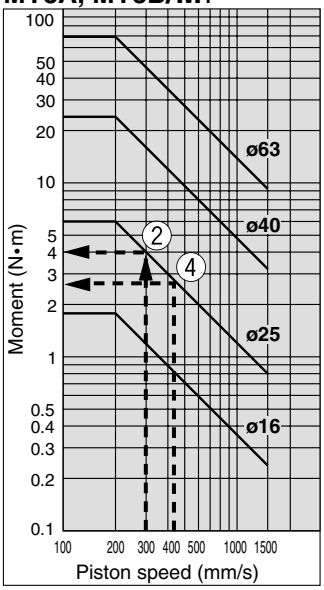
MY3A, MY3B/m_1



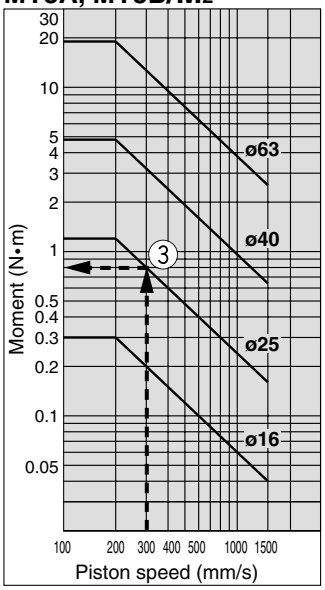
∗ Refer to page 18 for the MY3M.

Allowable Moment

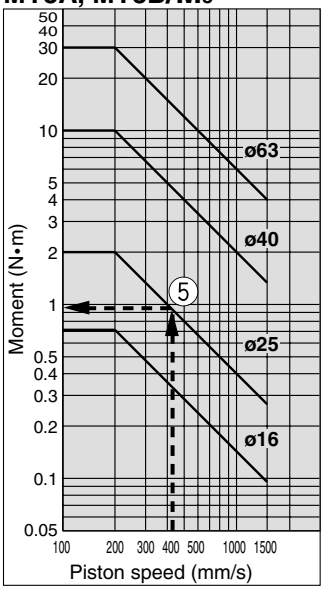
MY3A, MY3B/M_1



MY3A, MY3B/M_2



MY3A, MY3B/M_3



Maximum Allowable Moment / Maximum Allowable Load

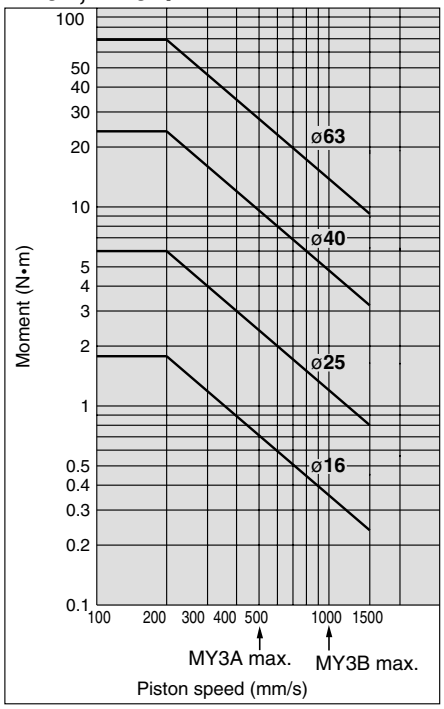
Series	Bore size (mm)	Maximum allowable moment (N•m)			Maximum allowable load (kg)		
		M_1	M_2	M_3	m_1	m_2	m_3
MY3A MY3B	16	1.8	0.3	0.7	6	3	1.5
	25	6	1.2	2	16	6	4
	40	24	4.8	10	40	12	10
	63	70	19	30	80	24	20

The above values are the maximum allowable values for moment and load. Refer to each graph regarding the maximum allowable moment and maximum allowable load for a particular piston speed.

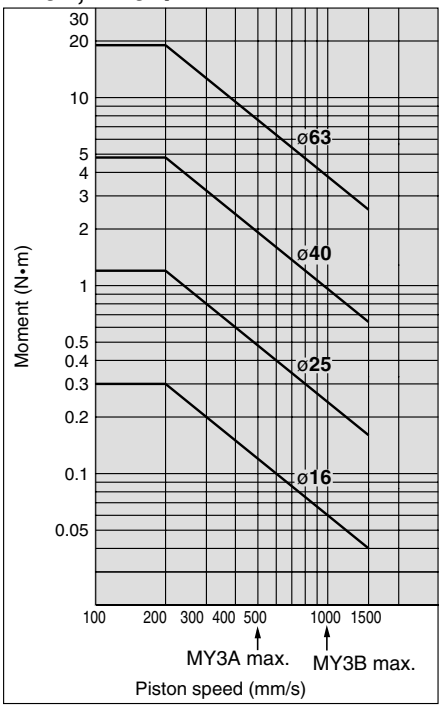
Maximum Allowable Moment

Select the moment from within the range of operating limits shown in the graphs. Note that the maximum allowable load value may sometimes be exceeded even within the operating limits shown in the graphs. Therefore, also check the allowable load for the selected conditions.

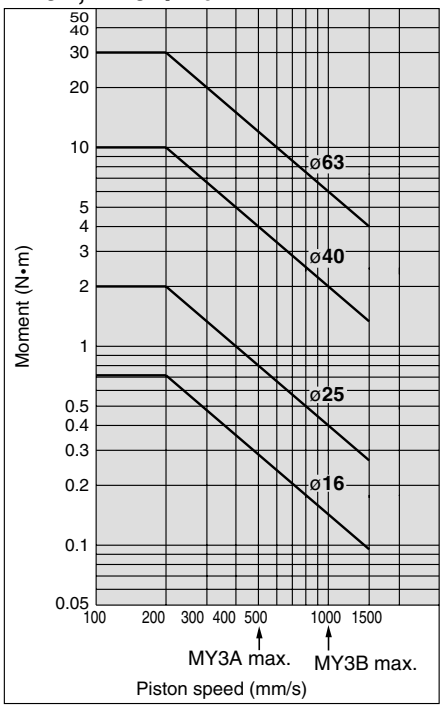
MY3A, MY3B/M_1



MY3A, MY3B/M_2



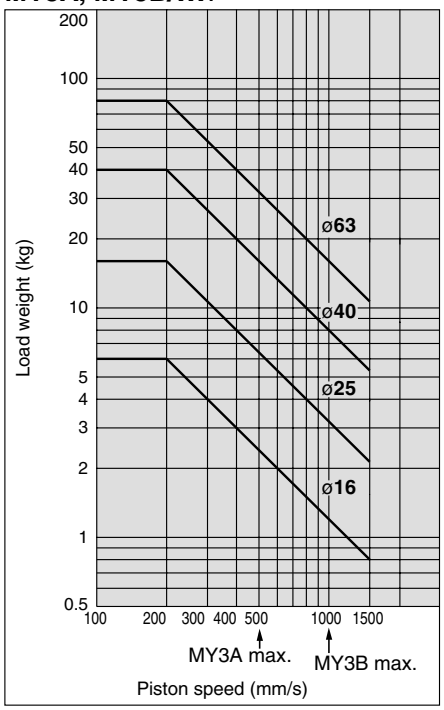
MY3A, MY3B/M_3



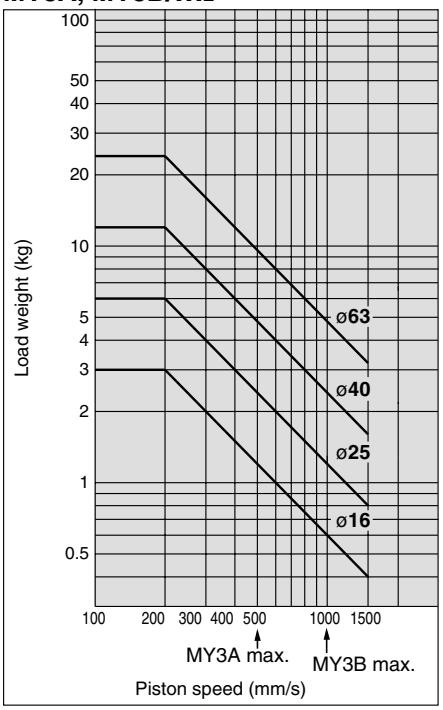
Maximum Allowable Load

Select the load from within the range of limits shown in the graphs. Note that the maximum allowable moment value may sometimes be exceeded even within the operating limits shown in the graphs. Therefore, also check the allowable moment for the selected conditions.

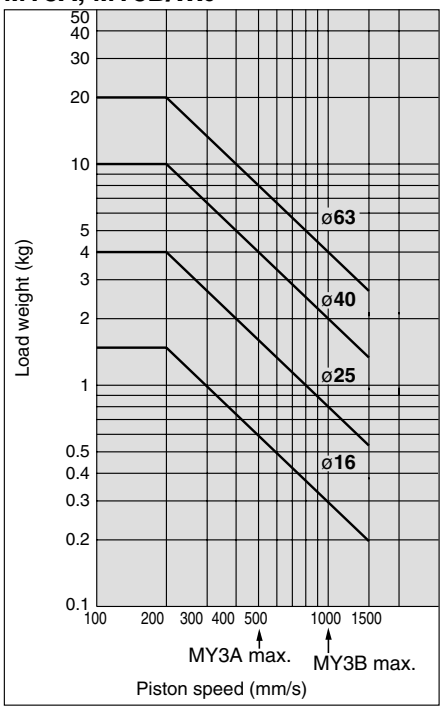
MY3A, MY3B/m_1



MY3A, MY3B/m_2



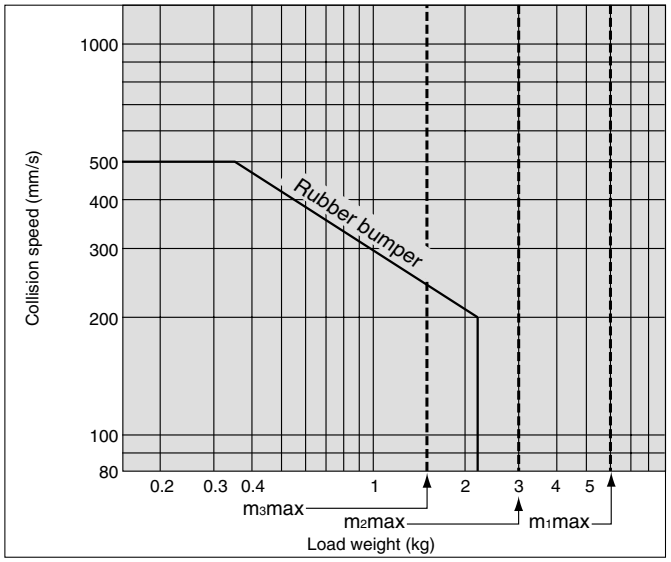
MY3A, MY3B/m_3



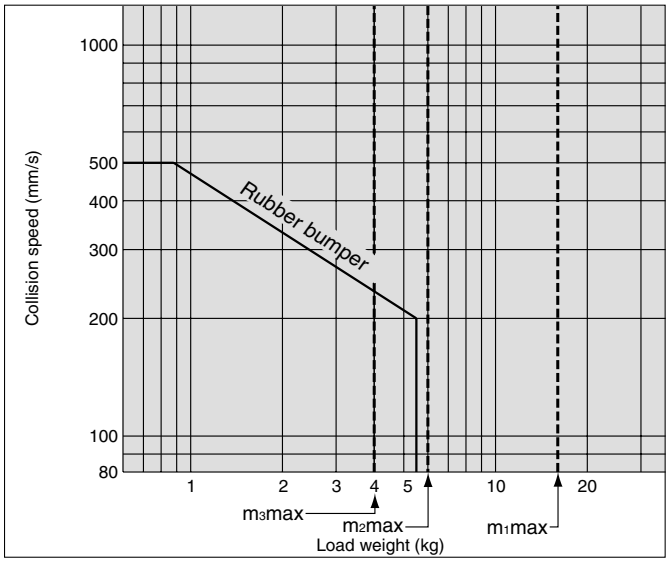
Cushion Capacity

Absorption Capacity of Rubber Bumper (MY3A)

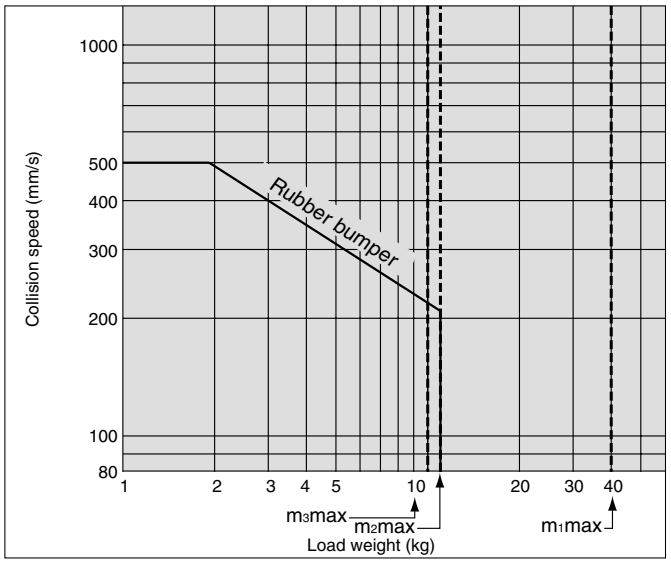
MY3A16 Horizontal collision: P = 0.5 MPa



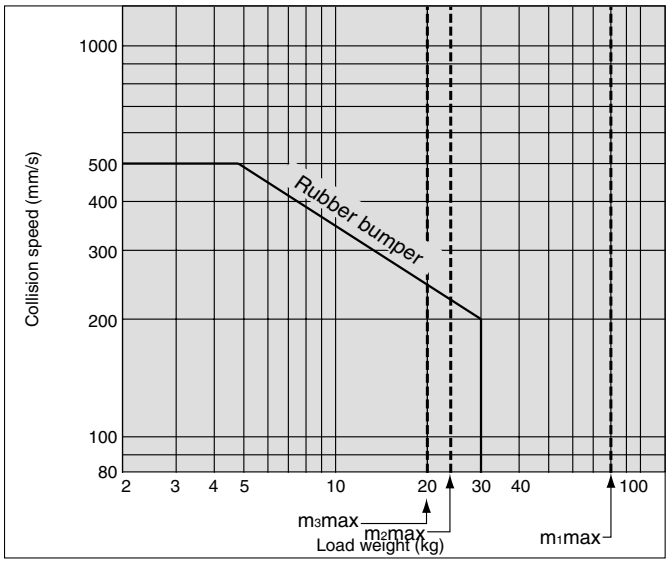
MY3A25 Horizontal collision: P = 0.5 MPa



MY3A40 Horizontal collision: P = 0.5 MPa



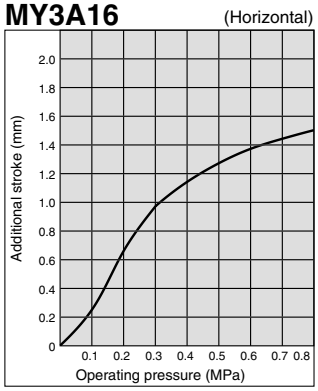
MY3A63 Horizontal collision: P = 0.5 MPa



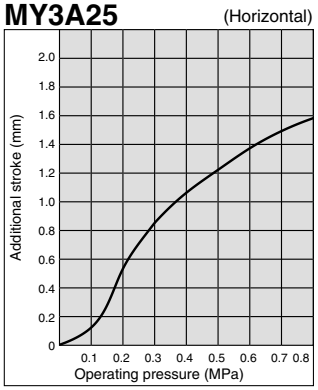
Rubber Bumper Displacement (Additional Stroke due to Operating Pressure on Each Side)

The stop position of the built-in rubber bumper of the MY3A series varies depending on the operating pressure. For alignment at the stroke end, follow the guideline bellow for the stroke end position during operation. First. find the incremental displacement at the operating pressure in the graph and then add it to the stroke end position at no pressurisation. If positioning accuracy is required for the stop position at the stroke end, consider installing an external positioning mechanism or switching to the air cushion type (MY3B).

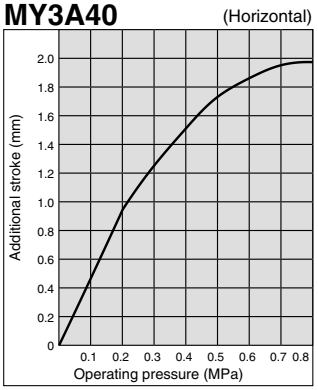
MY3A16 (Horizontal)



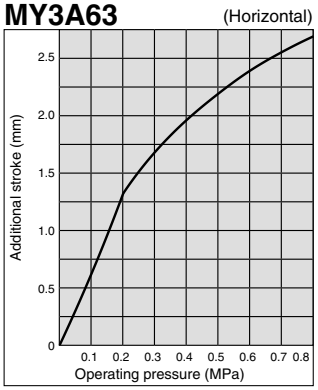
MY3A25 (Horizontal)



MY3A40 (Horizontal)



MY3A63 (Horizontal)

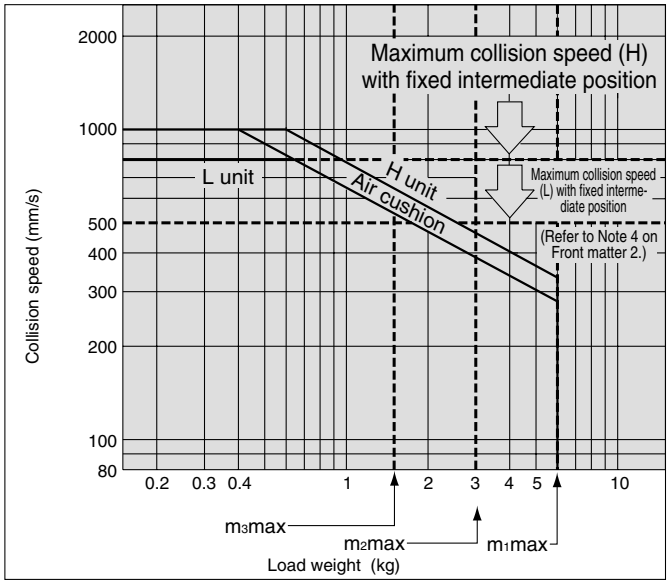


Note) In vertical operation, find the guideline for the stroke end position by adding, in case of the lower end, or subtracting, in case of the upper end, the pressure displacement equivalent to the self weight of the load.

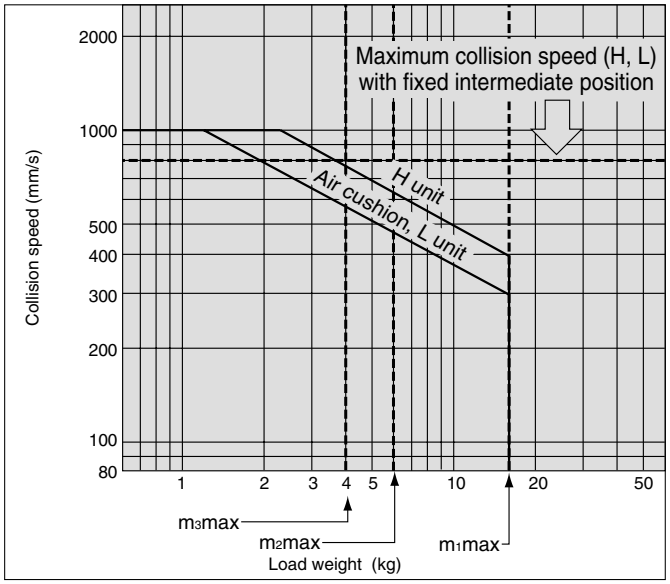
Cushion Capacity

Absorption Capacity of Air Cushion and Stroke Adjusting Unit (MY3B)

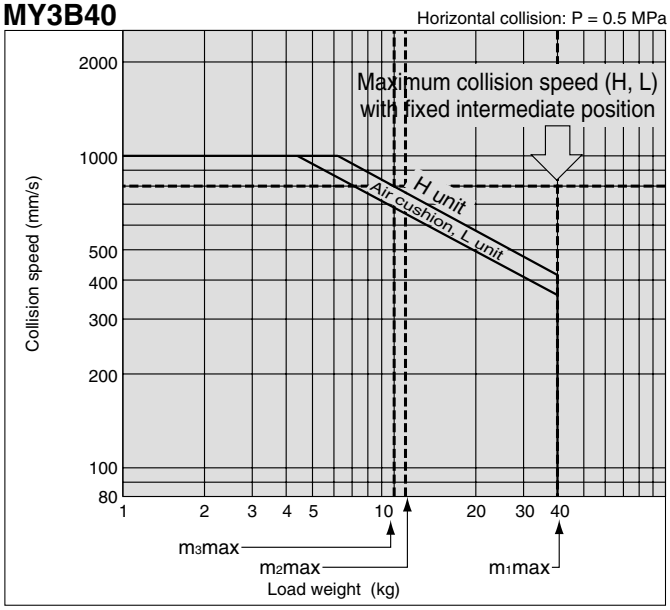
MY3B16



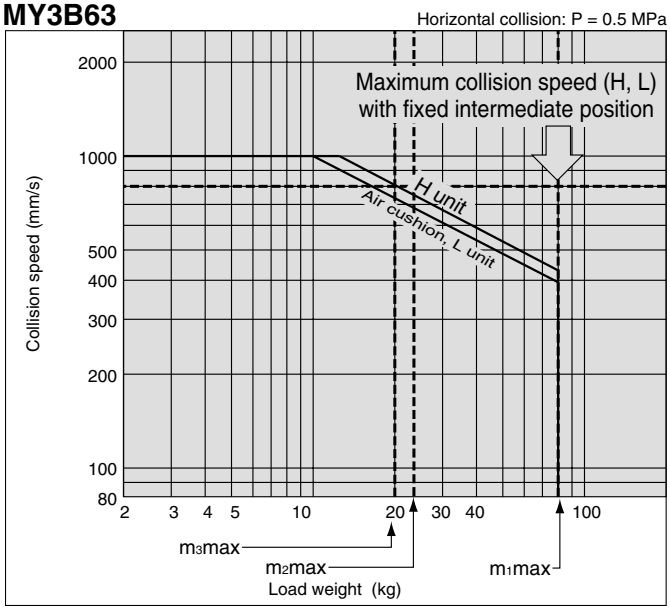
MY3B25



MY3B40



MY3B63



Air Cushion Stroke

Unit: mm

Bore size (mm)	Cushion stroke
16	13
25	18
40	25
63	30

Stroke Adjusting Unit Fine Stroke Adjustment Range

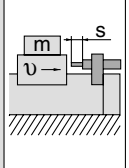
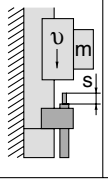
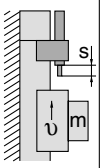
Unit: mm

Bore size (mm)	Fine stroke adjustment range (mm)
16	0 to -10
25	0 to -12
40	0 to -16
63	0 to -24

Note) The maximum operating speed will differ when the stroke adjusting unit is used outside the maximum fine stroke adjustment range (with reference to the fixed stroke end), such as at a fixed intermediate position (X416, X417). (Refer to the graph above.)

Calculation of Absorbed Energy for Stroke Adjusting Unit with Built-in Shock Absorber

Unit: N·m

	Horizontal	Vertical (downward)	Vertical (upward)
Type of collision			
Kinetic energy E_1	$\frac{1}{2}m \cdot \upsilon^2$		
Thrust energy E_2	$F \cdot s$	$F \cdot s + m \cdot g \cdot s$	$F \cdot s - m \cdot g \cdot s$
Absorbed energy E	$E_1 + E_2$		

Symbols
- υ: Speed of impacting object (m/s)
- m: Weight of impacting object (kg)
- F: Cylinder thrust (N)
- g: Gravitational acceleration (9.8 m/s²)
- s: Shock absorber stroke (m)

Note) The speed of the impacting object is measured at the time of collision with the shock absorber.

Note) With an operating pressure of 0.6 MPa or larger, the use of a cushion or an external shock absorber conforming to the conditions on page 7 is recommended.

External Shock Absorber Selection

When positioning of the stop position is necessary or the absorption capacity of the built-in cushion is not sufficient, refer to the selection procedure below and consider the installation of an external shock absorber.

Selection Items to confirm for Use with an External Shock Absorber

① When the cylinder is used alone.

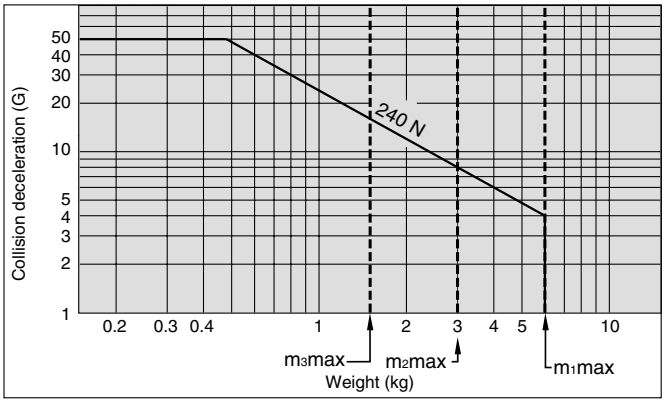
Cylinder load factor selection

⇩

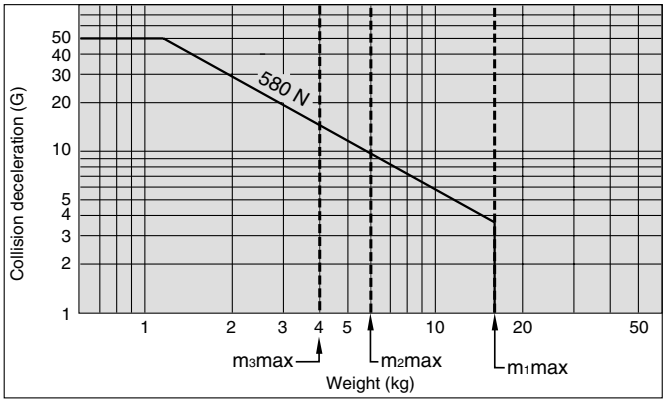
External shock absorber Impact force and absorption capacity confirmation

Allowable impact force for use with external shock absorber

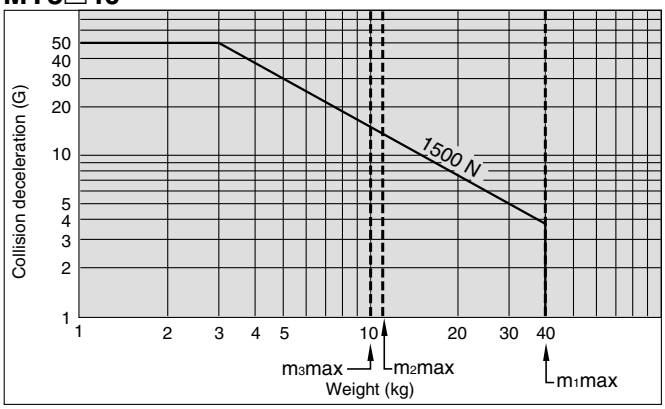
MY3□16



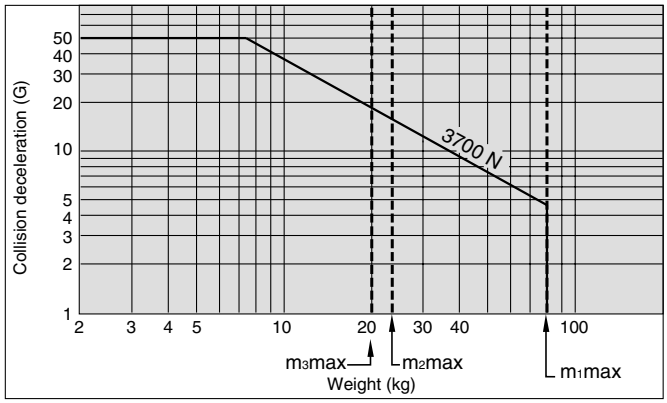
MY3□25



MY3□40



MY3□63



Note) The weight represents the equivalent weight including the thrust energy.

② When an external guide is used.

External guide load factor selection

⇩

External shock absorber Impact force and absorption capacity confirmation

Piston Speed for Use with an External Shock Absorber

Bore size (mm)	16	25	40	63
MY3A	80 to 1500 mm/s			
MY3B				

An external shock absorber can be used within the above piston speed range. However, in conjunction with the absortion capacity selection, also confirm the conditions to ensure that the shock absorber collision impact force to stays within the allowable range in the graph.
Use of an external shock absorber with conditions exceeding the allowable range may damage the cylinder.

To confirm the collision impact force of the shock absorber, first find the impact force or acceleration under the operating conditions using the selection information or selection software provided by the manufacturer and then, refer to the graph.
(The selection should allow sufficient margin because the value calculated by the selection software involves an error with reference to the actual value.)

Example of Recommended Use of the External Shock Absorber

MY3□16 ⟹ RB−OEM0.25M
MY3□25 ⟹ RB−OEM0.5M
MY3□40 ⟹ RB−OEM1.0MF
MY3□63 ⟹ RB−OEM1.5M x 1

Mechanically Jointed Rodless Cylinder

Series MY3A/3B

Basic Type: ø16, ø25, ø40, ø63

How to Order

Basic

MY3 A 16 — 300 LS — M9B

Type

A	Short type (Rubber bumper)
B	Standard type (Air cushion)

Cylinder bore size

16	16 mm
25	25 mm
40	40 mm
63	63 mm

Port thread type

Symbol	Type	Bore size
-	M thread	ø16
	Rc	ø25, ø40, ø63
TN	NPT	
TF	G	

Stroke

∗ Refer to "Standard Stroke" table.

Stroke adjusting unit (MY3B only)

-	Without adjusting unit
L	With shock absorbers for low load on both sides
H	With shock absorbers for high load on both sides
LS	With a shock absorber for low load on left side
SL	With a shock absorber for low load on right side
HS	With a shock absorber for high load on left side
SH	With a shock absorber for high load on right side
LH	With L unit on left side and H unit on right side
HL	With H unit on left side and L unit on right side

Auto switch

-	Without auto switch

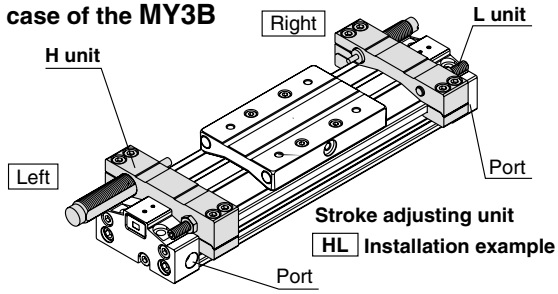
∗ Refer to the table below for auto switch model numbers.
∗ Auto switches are shipped together, but not assembled.

Number of auto switches

-	2 pcs.
S	1 pc.
n	"n" pcs.

Stroke adjusting unit appearance and mounting direction

In case of the MY3B



Applicable Auto Switches/ Refer to pages 29 to 33 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage DC	Load voltage AC	Auto switch model: Electrical entry Perpendicular	Auto switch model: Electrical entry In-line	Lead wire length (m)∗ 0.5 (-)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
Reed switch	—	Grommet	Yes	3-wire (NPN equiv.)	—	5 V	—	**A96V**	**A96**	●	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	**A93V**	**A93**	●	●	—	—	—	Relay, PLC
			—			5 V, 12 V	100 V or less	**A90V**	**A90**	●	●	—	—	IC circuit	
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V 12V	—	**M9NV**	**M9N**	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				**M9PV**	**M9P**	●	●	○	○		
				2-wire		12 V		**M9BV**	**M9B**	●	●	○	○	—	
	Diagnostic indication (2-colour indication)			3-wire (NPN)		5 V 12 V		**F9NWV**	**F9NW**	●	●	○	○	IC circuit	
				3-wire (PNP)				**F9PWV**	**F9PW**	●	●	○	○		
				2-wire		12 V		**F9BWV**	**F9BW**	●	●	○	○	—	

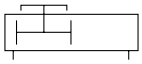
∗ Lead wire length symbols: 0.5 m..... - (Example) M9N
3 m..... L M9NL
5 m..... Z M9NZ

Note) ∗ Solid state switches marked with a "○" symbol are produced upon receipt of order.
∗ In addition to the models in the above table, there are some other auto switches that are applicable. For more information, please refer to page 28.

MY3A

MY3B

Symbol



Specifications

Bore size (mm)	16	25	40	63
Fluid	Air			
Action	Double acting			
Operating pressure range	0.15 to 0.8 MPa			
Proof pressure	1.2 MPa			
Ambient and fluid temperature	5 to 60°C			
Cushion	Rubber bumper (MY3A) / Air cushion (MY3B)			
Lubrication	Non-lube			
Stroke length tolerance	1000 mm or less $^{+1.8}_{0}$, From 1001 mm $^{+2.8}_{0}$ Note)			
Port size (Rc, NPT, G)	M5	1/8	1/4	3/8

Note) The tolerance of the MY3A is a value with no pressurisation. When a rubber bumper is used, the stroke of the MY3A varies according to the operating pressure. To find the stroke length tolerance at a particular operating pressure, double the additional stroke due to operating pressure on each side (page 5) and add it.

Stroke Adjusting Unit Specifications

Bore size (mm)		16		25		40		63	
Unit symbol		L	H	L	H	L	H	L	H
Shock absorber model		RB0806	RB1007	RB1007	RB1412	RB1412	RB2015	RB2015	RB2725
Fine stroke adjustment range (mm)	**MY3B**	0 to −10		0 to −12		0 to −16		0 to −24	

Piston Speed

Bore size (mm)	16	25	40	63
Without stroke adjusting unit (MY3A)	80 to 500 mm/s			
Without stroke adjusting unit (MY3B)	80 to 1000 mm/s			
Stroke adjusting unit (L and H unit/MY3B)	80 to 1000 mm/s (ø16 L unit: 80 to 800 mm/s)			
✻ **External shock absorber (low reaction type)**	80 to 1500 mm/s			

✻ Refer to "External Shock Absorber Selection" on page 7.
When the RB series is used, operate at a piston speed that will not exceed the absorption capacity of the air cushion and stroke adjusting unit.

Standard Stroke

Bore size (mm)	Standard stroke (mm)✻	Max. manufacturable stroke (mm)
16, 25 40, 63	100, 200, 300, 400, 500, 600 700, 800, 900, 1000, 1200 1400, 1600, 1800, 2000	3000

✻ Strokes are manufacturable in 1 mm increments, up to the maximum stroke. However, when exceeding 2000 mm stroke, add "-XB11" to the end of the model number. Refer to "Made to Order " on page 34.

Theoretical Output

Unit: N

Bore size (mm)	Piston area (mm^2)	Operating pressure (MPa)						
		0.2	0.3	0.4	0.5	0.6	0.7	0.8
16	200	40	60	80	100	120	140	160
25	490	98	147	196	245	294	343	392
40	1256	251	377	502	628	754	879	1005
63	3115	623	934	1246	1557	1869	2180	2492

Note) Theoretical output (N) = Pressure (MPa) x Piston area (mm^2)

Option

Stroke Adjusting Unit Model

Model	Unit		Bore size (mm) 16	25	40	63
MY3B	**L unit**	Left	MY3B-A16L1	MY3B-A25L1	MY3B-A40L1	MY3B-A63L1
		Right	MY3B-A16L2	MY3B-A25L2	MY3B-A40L2	MY3B-A63L2
	H unit	Left	MY3B-A16H1	MY3B-A25H1	MY3B-A40H1	MY3B-A63H1
		Right	MY3B-A16H2	MY3B-A25H2	MY3B-A40H2	MY3B-A63H2

Shock Absorber Specifications

Model		RB 0806	RB 1007	RB 1412	RB 2015	RB 2725
Max. energy absorption (J)		0.84	2.4	10.1	29.8	46.6
Stroke absorption (mm)		6	7	12	15	25
Max. collision speed (mm/s)		1000				
Max. operating frequency (cycle/min)		80	70	45	25	10
Spring force (N)	**Extended**	1.96	4.22	6.86	8.34	8.83
	Compressed	4.22	6.86	15.98	20.50	20.01
Operating temperature range (°C)		5 to 60				

Weight

Unit: kg

Model	Bore size (mm)	Basic weight	Additional weight per 50 mm stroke	Stroke adjusting unit weight (per unit)	
				L unit weight	H unit weight
MY3A	**16**	0.22	0.06		
	25	0.65	0.17		
	40	2.45	0.25		
	63	7.14	0.56		
MY3B	**16**	0.23	0.06	0.04	0.05
	25	0.75	0.17	0.10	0.15
	40	2.58	0.25	0.26	0.30
	63	7.87	0.56	0.57	0.92

Calculation method/Example: **MY3B25-300L**

Basic weight ····· 0.75 kg
Additional weight ····· 0.17/50 st
L unit weight ····· 0.1 kg

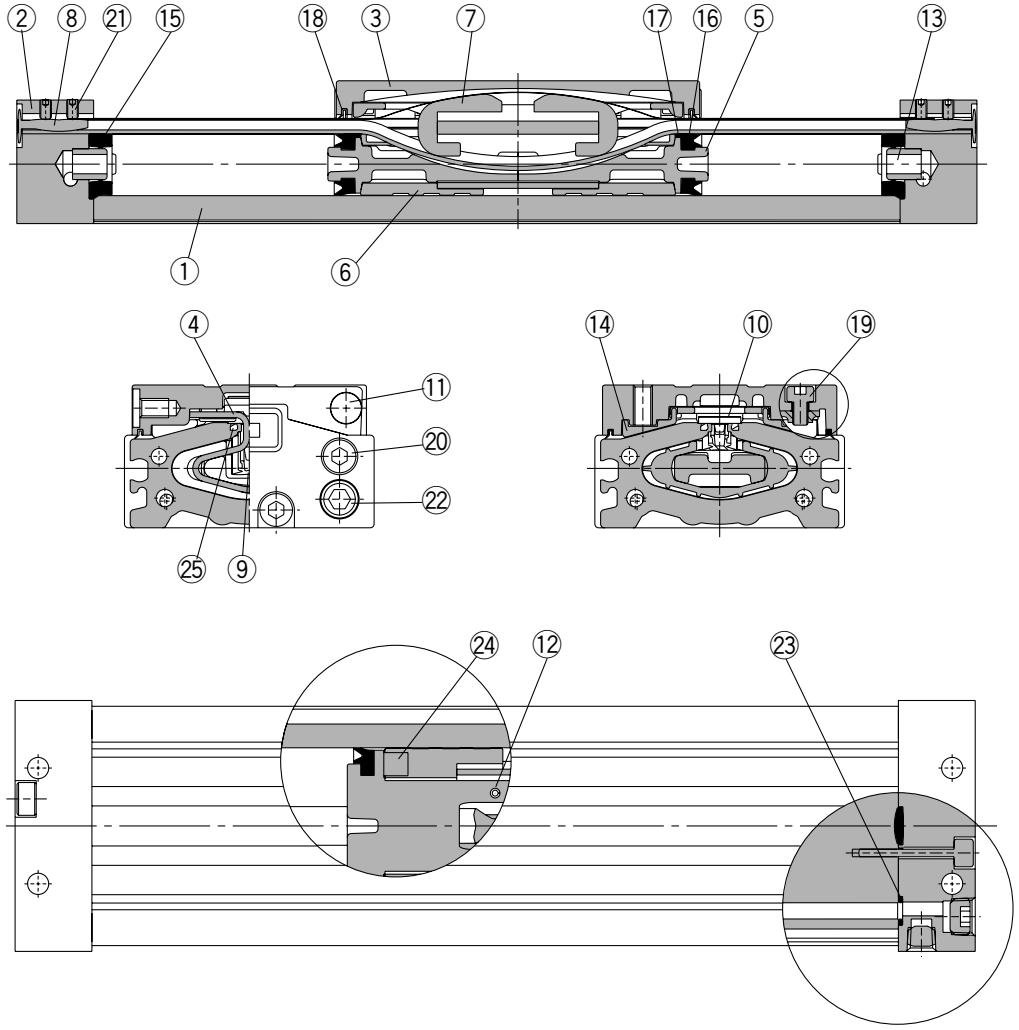
Cylinder stroke ····· 300 st
$0.75 + 0.17 \times 300 \div 50 + 0.1 \times 2 \approx 1.97$ kg

Made to Order

Refer to pages 34 to 35 regarding "Made to Order" for the MY3A/B series.

Construction

MY3A



Component Parts

No.	Description	Material	Note
1	**Cylinder tube**	Aluminum alloy	Hard anodized
2	**Head cover**	Aluminum alloy	Hard anodized
3	**Slide table**	Aluminum alloy	Electroless nickel plated
4	**Piston yoke**	Stainless steel	
5	**Piston**	Aluminum alloy	Chromated
6	**Wear ring**	Special resin	
7	**Belt separator**	Special resin	
8	**Belt clamp**	Special resin	
11	**Stopper**	Carbon steel	Nickel plated

Component Parts

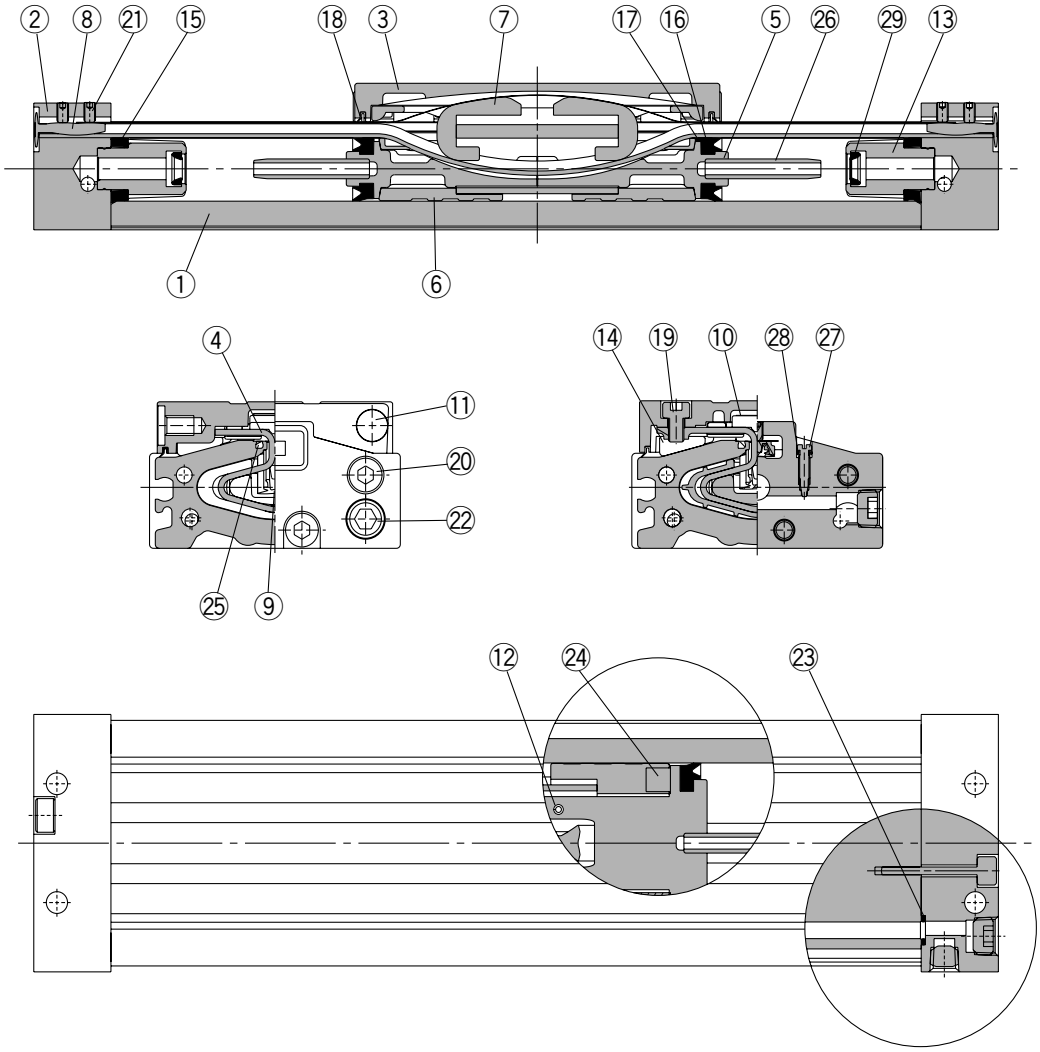
No.	Description	Material	Note
12	**Spring pin**	Carbon tool steel	
13	**Seal ring**	Brass	
14	**Bearing**	Special resin	
17	**Inner wiper**	Special resin	
19	**Hexagon socket head cap screw**	Chrome molybdenum steel	Nickel plated
20	**Hexagon socket head cap screw**	Chrome molybdenum steel	Nickel plated
21	**Hexagon socket head set screw**	Chrome molybdenum steel	Nickel plated
22	**Hexagon socket head plug**	Carbon steel	Nickel plated
24	**Magnet**	Rare earth magnet	
25	**Seal magnet**	Rubber magnet	

Seal List

No.	Description	Material	Qty.	MY3A16	MY3A25	MY3A40	MY3A63
9	Seal belt	Special resin	1	MY3A16-16A-Stroke	MY3A25-16A-Stroke	MY3A40-16A-Stroke	MY3A63-16A-Stroke
10	Dust seal band	Stainless steel	1	MY3A16-16B-Stroke	MY3A25-16B-Stroke	MY3A40-16B-Stroke	MY3A63-16B-Stroke
15	Gasket bumper	NBR	2	RMA-16	RMA-25	RMA-40	RMA-63
16	Piston seal	NBR	2	RMY-16	RMY-25	RMY-40	RMY-63
18	Scraper	Special resin	1	MYA16-15-R6656	MYA25-15-R6657	MYA40-15-R6658	MYA63-15-R6659
23	O-ring	NBR	4	ø6.2 x ø3 x ø1.6	C-5	ø10.5 x ø8.5 x ø1	C-14

Construction

MY3B



Component Parts

No.	Description	Material	Note
1	**Cylinder tube**	Aluminum alloy	Hard anodized
2	**Head cover**	Aluminum alloy	Hard anodized
3	**Slide table**	Aluminum alloy	Electroless nickel plated
4	**Piston yoke**	Stainless steel	
5	**Piston**	Aluminum alloy	Chromated
6	**Wear ring**	Special resin	
7	**Belt separator**	Special resin	
8	**Belt clamp**	Special resin	
11	**Stopper**	Carbon steel	Nickel plated
12	**Spring pin**	Carbon tool steel	

Component Parts

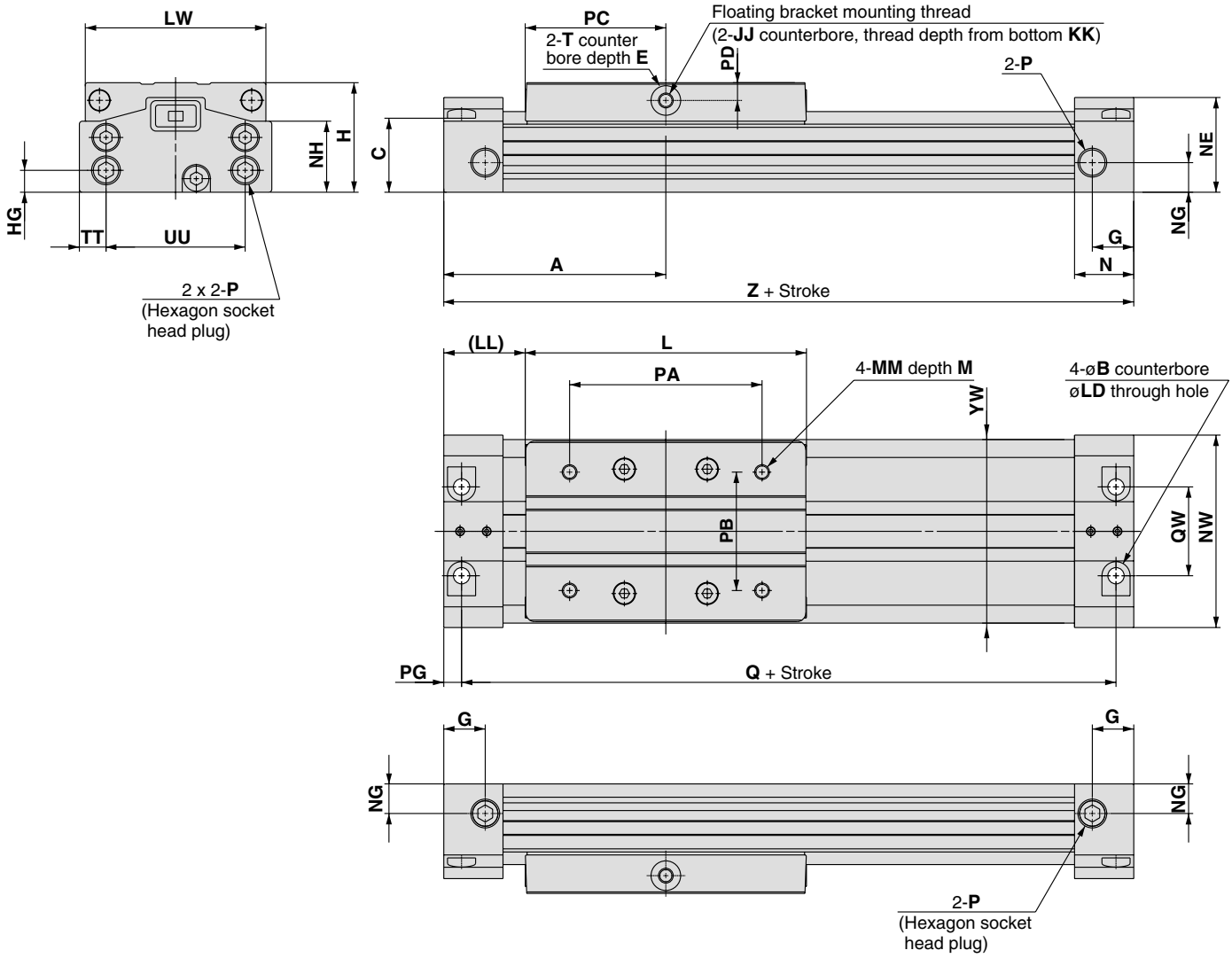
No.	Description	Material	Note
13	**Cushion boss**	Aluminum alloy	Chromated
14	**Bearing**	Special resin	
17	**Inner wiper**	Special resin	
19	**Hexagon socket head cap screw**	Chrome molybdenum steel	Nickel plated
20	**Hexagon socket head cap screw**	Chrome molybdenum steel	Nickel plated
21	**Hexagon socket head set screw**	Chrome molybdenum steel	Nickel plated
22	**Hexagon socket head plug**	Carbon steel	Nickel plated
24	**Magnet**	Rare earth magnet	
25	**Seal magnet**	Rubber magnet	
26	**Cushion ring**	Brass	
27	**Cushion needle**	Rolled steel	Nickel plated

Seal List

No.	Description	Material	Qty.	MY3B16	MY3B25	MY3B40	MY3B63
9	Seal belt	Special resin	1	MY3B16-16A-Stroke	MY3B25-16A-Stroke	MY3B40-16A-Stroke	MY3B63-16A-Stroke
10	Dust seal band	Stainless steel	1	MY3B16-16B-Stroke	MY3B25-16B-Stroke	MY3B40-16B-Stroke	MY3B63-16B-Stroke
15	Tube gasket	NBR	2	RMB-16	RMB-25	RMB-40	RMB-63
16	Piston seal	NBR	2	RMY-16	RMY-25	RMY-40	RMY-63
18	Scraper	Special resin	1	MYA16-15-R6656	MYA25-15-R6657	MYA40-15-R6658	MYA63-15-R6659
23	O-ring	NBR	4	ø6.2 × ø3 × ø1.6	C-5	ø10.5 × ø8.5 × ø1	C-14
28	O-ring	NBR	2	ø4 × ø1.8 × ø1.1	ø4 × ø1.8 × ø1.1	ø7.15 × ø3.75 × ø1.7	ø8.3 × ø4.5 × ø1.9
29	Cushion seal	NBR	2	MCS-3	MCS-5	RCS-8	RCS-12

Short Type: ø16, ø25, ø40, ø63

MY3A Bore size — Stroke



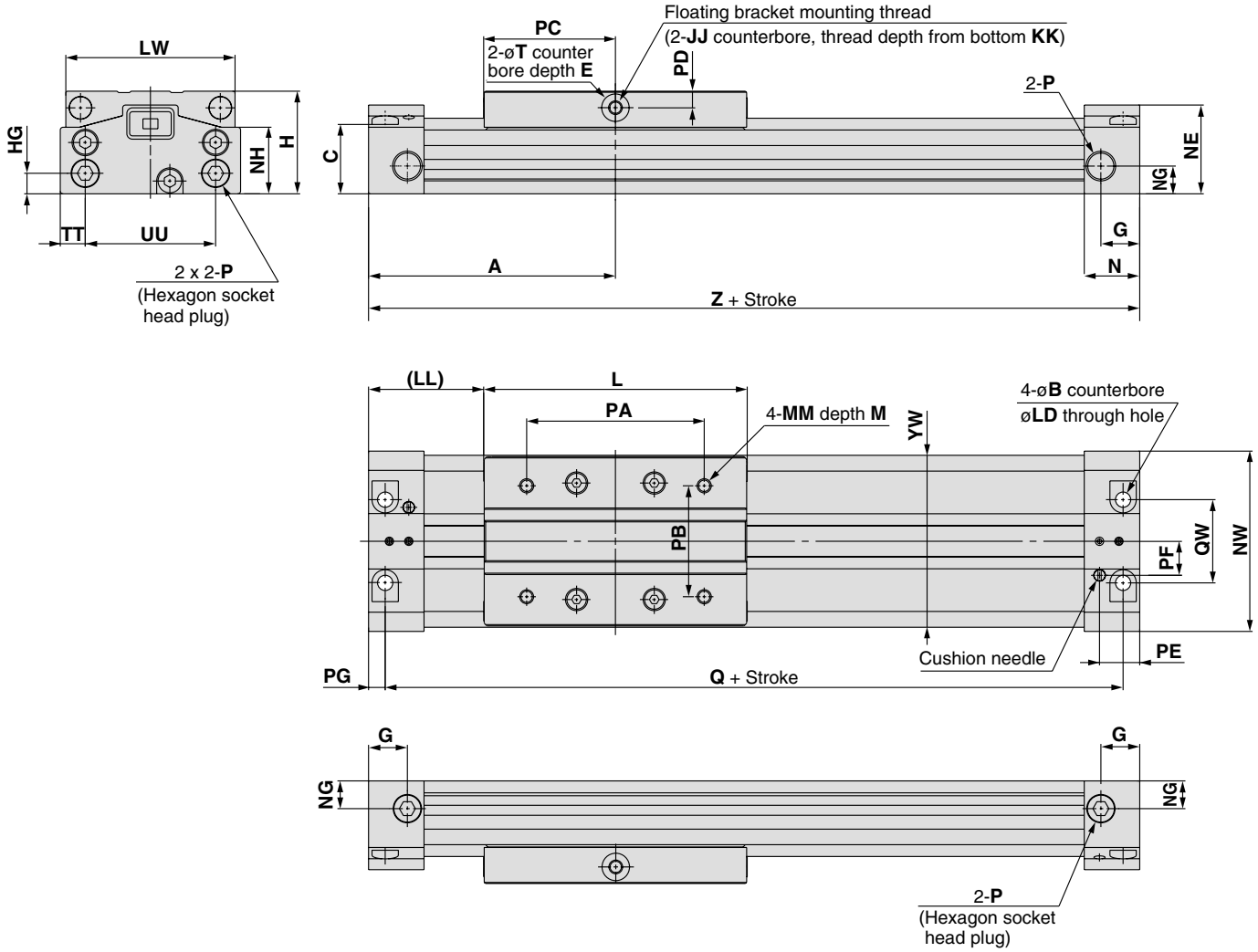
(mm)

Model	A	B	C	E	G	H	HG	JJ	KK	L	LD	LL	LW	M	MM	N
MY3A16	55	6	18	2	9.5	27	5	M4	5	65	3.5	22.5	41	6	M4	13.5
MY3A25	75	9.5	25	2	14	37	7.4	M5	7.5	95	5.5	27.5	61	8	M5	20
MY3A40	120	14	38	2	18	54	12	M6	12	160	8.6	40	90	12	M6	27
MY3A63	160	17	60	3	20.5	84	16.5	M8	22	220	11	50	134	16	M8	31

Model	NE	NG	NH	NW	P	PA	PB	PC	PD	PG	Q	QW	T	TT	UU	YW	Z
MY3A16	22.5	8	17.2	43	M5	44	26	32.5	4	4	102	19	7	6.5	30	42	110
MY3A25	32	10	24	65	Rc, NPT, G1/8	64	40	47.5	6	6	138	30	10	9	47	62	150
MY3A40	46	15	37	94	Rc, NPT, G1/4	112	60	80	7.5	8.5	223	40	14	14	66	92	240
MY3A63	70	29	58	139	Rc, NPT, G3/8	162	84	110	10	10	300	64	16	20	99	136	320

Standard Type: ø16, ø25, ø40, ø63

MY3B **Bore size** — **Stroke**



(mm)

Model	A	B	C	E	G	H	HG	JJ	KK	L	LD	LL	LW	M	MM	N
MY3B16	61	6	18	2	9.5	27	5	M4	5	65	3.5	28.5	41	6	M4	13.5
MY3B25	89	9.5	25	2	14	37	7.4	M5	7.5	95	5.5	41.5	61	8	M5	20
MY3B40	138	14	38	2	18	54	12	M6	12	160	8.6	58	90	12	M6	27
MY3B63	178	17	60	3	20.5	84	16.5	M8	22	220	11	68	134	16	M8	31

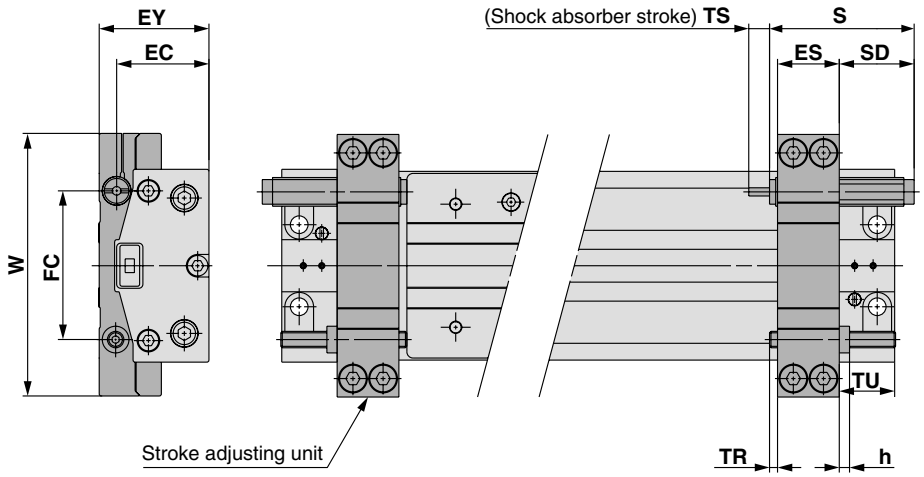
Model	NE	NG	NH	NW	P	PA	PB	PC	PD	PE	PF	PG	Q	QW	T	TT	UU	YW	Z
MY3B16	22.5	8	17.2	43	M5	44	26	32.5	4	9.7	8.5	4	114	19	7	6.5	30	42	122
MY3B25	32	10	24	65	Rc, NPT, G1/8	64	40	47.5	6	14.5	12.2	6	166	30	10	9	47	62	178
MY3B40	46	15	37	94	Rc, NPT, G1/4	112	60	80	7.5	19.5	16.5	8.5	259	40	14	14	66	92	276
MY3B63	70	29	58	139	Rc, NPT, G3/8	162	84	110	10	23.5	27.5	10	336	64	16	20	99	136	356

Standard Type: ø16, ø25, ø40, ø63

Stroke adjusting unit

Shock absorber for low load + Adjusting bolt

MY3B Bore size — Stroke L



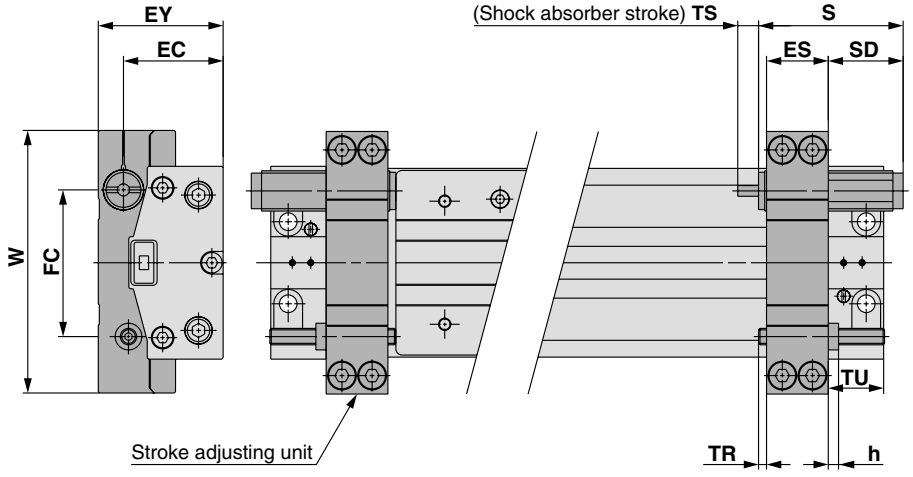
(mm)

Applicable cylinder	ES	EC	EY	FC	h	S	SD	TS	TR	TU	W	Shock absorber model
MY3B16	14.1	21.5	26.5	34.5	2.4	40.8	25.8	6	0.9	25	62	RB0806
MY3B25	20.1	29.8	36.5	51.5	3.6	46.7	25.2	7	1.4	28.5	90	RB1007
MY3B40	30.1	45	53.5	72.5	5	67.3	36.3	12	0.9	39	128	RB1412
MY3B63	36.1	70.5	83.5	108	6	73.2	36.2	15	0.9	43	178	RB2015

Note) When the stroke adjusting unit is used, the fitting type, which can be connected with the port on the body front and the back, will be limited.

Shock absorber for high load + Adjusting bolt

MY3B Bore size — Stroke H



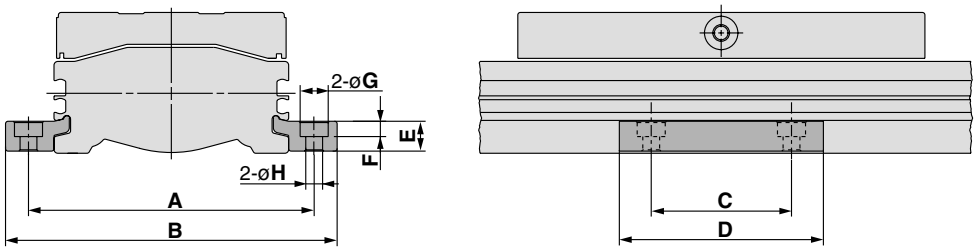
(mm)

Applicable cylinder	ES	EC	EY	FC	h	S	SD	TS	TR	TU	W	Shock absorber model
MY3B16	14.1	23	29.5	34.5	2.4	46.7	31.7	7	0.9	25	62	RB1007
MY3B25	20.1	31.8	41	52.2	3.6	67.3	45.8	12	1.4	28.5	90	RB1412
MY3B40	30.1	48	60.5	73.5	5	73.2	42.2	15	0.9	39	128	RB2015
MY3B63	36.1	74.5	91	108	6	99	62	25	0.9	43	178	RB2725

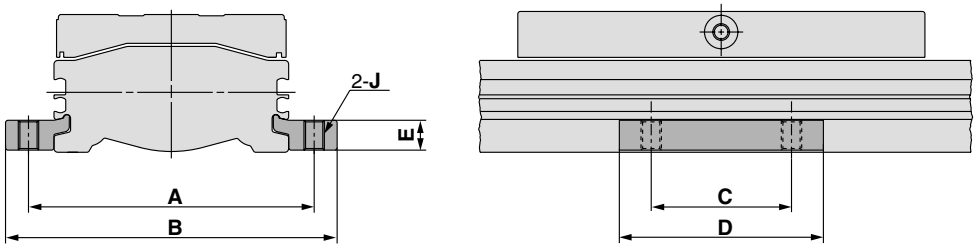
Note) When the stroke adjusting unit is used, the fitting type, which can be connected with the port on the body front and the back, will be limited.

Side Support

Side support A
MY-S□A



Side support B
MY-S□B

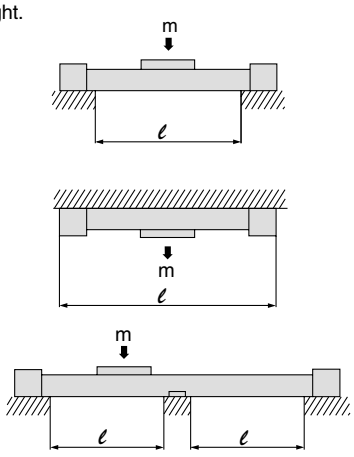


(mm)

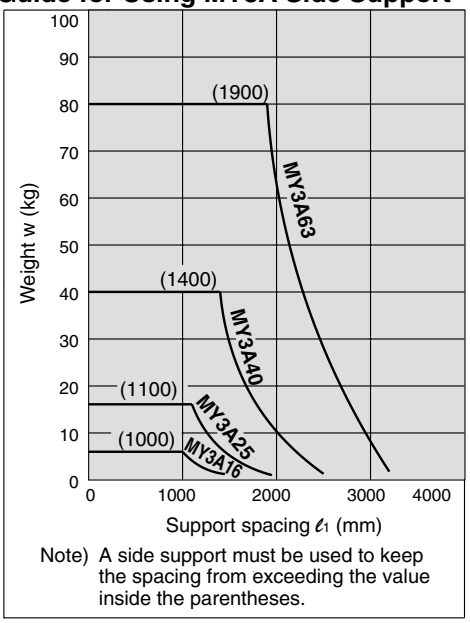
Model	Applicable cylinder	A	B	C	D	E	F	G	H	J
MY-S16 A/B	MY3A16 / MY3B16	53	63.6	15	26	4.9	3	6.5	3.4	M4
MY-S25 A/B	MY3A25 / MY3B25	77	91	35	50	8	5	9.5	5.5	M6
MY-S32 A/B	MY3A40 / MY3B40	112	130	45	64	11.7	6	11	6.6	M8
MY-S40 A/B	MY3A63 / MY3B63	160	182	55	80	14.8	8.5	14	9	M10

Guide for Using Side Support

For long stroke operation, the cylinder tube may be deflected depending on its own weight and the load weight. In such a case, use a side support in the middle section. The spacing (ℓ) of the support must be no more than the values shown in the graph on the right.

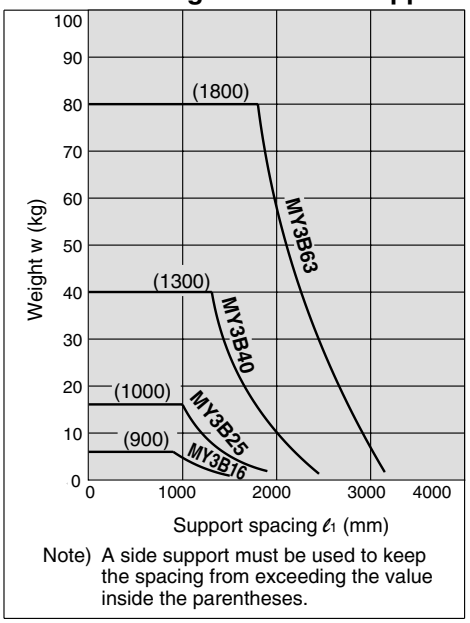


Guide for Using MY3A Side Support



Note) A side support must be used to keep the spacing from exceeding the value inside the parentheses.

Guide for Using MY3B Side Support



Note) A side support must be used to keep the spacing from exceeding the value inside the parentheses.

⚠ Caution

① If the cylinder mounting surfaces are not measured accurately, using a side support may cause poor operation. Therefore, be sure to level the cylinder tube when mounting. Also, for long stroke operation involving vibration and impact, use of a side support is recommended even if the spacing value is within the allowable limits shown in the graph.

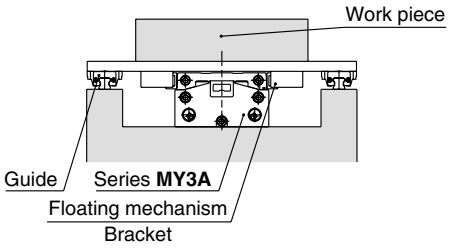
② Support brackets are not for mounting; use them solely for providing support.

Floating Bracket

Facilitates connection to other guide systems.

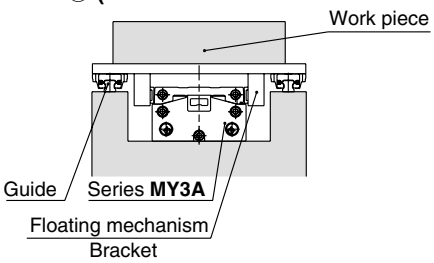
Application

Mounting direction ① (to minimise the installation height)

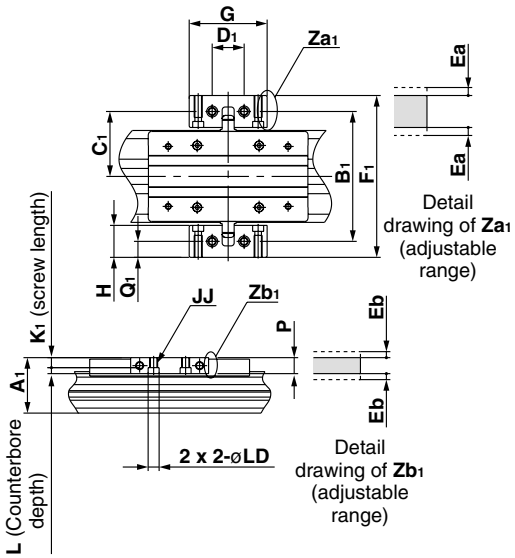


Application

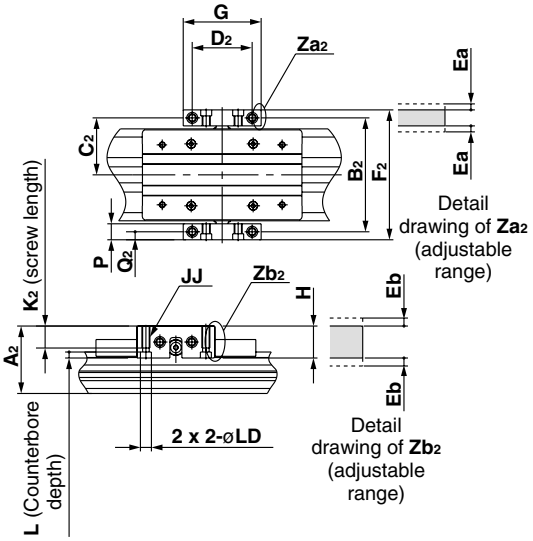
Mounting direction ② (to minimise the installation width)



Mounting Example



Mounting Example



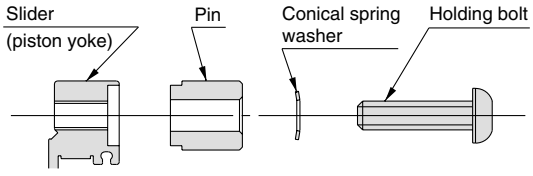
MY3□ Floating Bracket Mounting Dimensions (mm)

Model	Applicable cylinder	Common						Adjusting range	
		G	H	JJ	L	P	LD	Ea	Eb
MYAJ16	MY3□16	38	20	M4	4.5	10	6	1	1
MYAJ25	MY3□25	55	22	M6	5.5	12	9.5	1	1
MYAJ40	MY3□40	72	32	M8	6.5	16	11	1	1
MYAJ63	MY3□63	100	40	M10	9	19	14	1	1

Model	Applicable cylinder	Mounting direction ①						
		A1	B1	C1	D1	F1	K1	Q1
MYAJ16	MY3□16	29	68	34	18	88	5.5	10
MYAJ25	MY3□25	38.5	90	45	24	112	6.5	11
MYAJ40	MY3□40	56	130	65	32	162	9.5	16
MYAJ63	MY3□63	86	186	93	50	226	10	20

Model	Applicable cylinder	Mounting direction ②						
		A2	B2	C2	D2	F2	K2	Q2
MYAJ16	MY3□16	36	58	29	30	68	10	5
MYAJ25	MY3□25	46	80	40	40	92	14	6
MYAJ40	MY3□40	68	114	57	55	130	19	8
MYAJ63	MY3□63	100	166	83	80	185	23	9.5

Installation of Holding Bolts



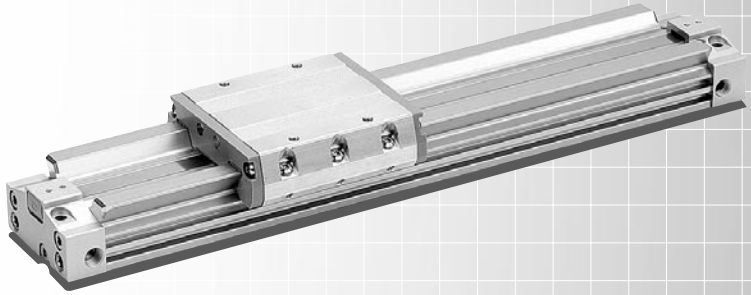
Tightening Torque for Holding Bolts

Unit: N·m

Model	Tightening torque	Model	Tightening torque
MYAJ16	1.5	MYAJ40	5
MYAJ25	3	MYAJ63	13

Series MY3M

Slide bearing type (Air cushion)
ø16, ø25, ø40, ø63



Series MY3M

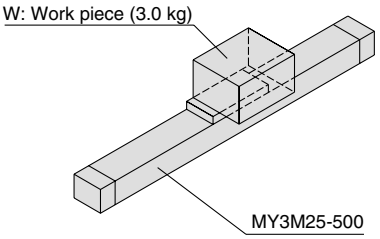
Model Selection

The following are steps for selecting the MY3M series which is best suited to your application.

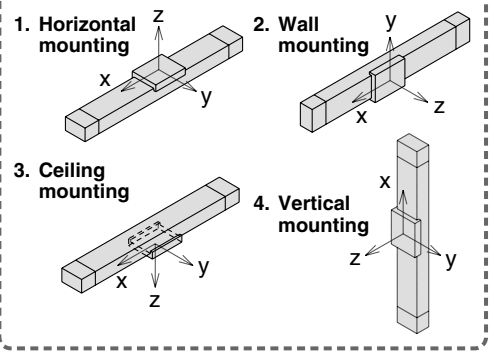
Calculation of Guide Load Factor

1 Operating Conditions

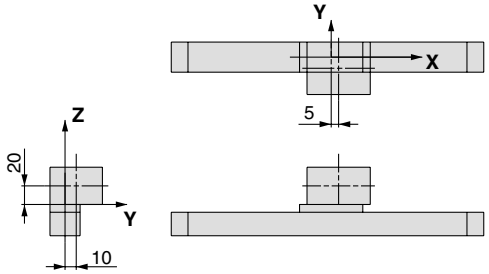
Cylinder ····· MY3M25-500
Average operating speed υa ····· 400 mm/s
Mounting direction ····· Horizontal mounting
Cushion ····· Air cushion (δ = 1/100)



Mounting Direction



2 Load Blocking



Work Piece Weight and Centre of Gravity

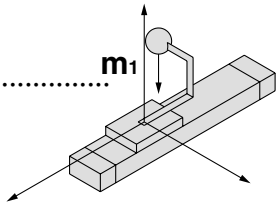
Work piece no.	Mass (m)	Centre of gravity		
		X-axis	Y-axis	Z-axis
W	3.0 kg	5 mm	10 mm	20 mm

3 Calculation of Load Factor for Static Load

m_1: Mass

m_1 max (from ① of graph MY3M/m_1) = 19.0 (kg) ·····

Load factor $\alpha_1 = m_1/m_1$ max = 3.0/19.0 = **0.16**

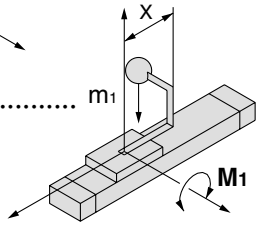


M_1: Moment

M_1 max (from ② of graph MY3M/M_1) = 8 (N•m) ·····

$M_1 = m_1 \times g \times X = 3.0 \times 9.8 \times 5 \times 10^{-3} = 0.15$ (N•m)

Load factor $\alpha_2 = M_1/M_1$ max = 0.15/8 = **0.02**

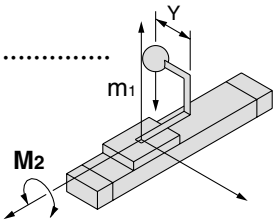


M_2: Moment

M_2 max (from ③ of graph MY3M/M_2) = 4.5 (N•m) ·····

$M_3 = m_1 \times g \times Y = 3.0 \times 9.8 \times 10 \times 10^{-3} = 0.29$ (N•m)

Load factor $\alpha_3 = M_2/M_2$ max = 0.29/4.5 = **0.07**

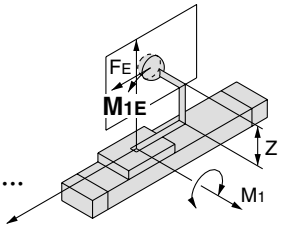


Calculation of Guide Load Factor

4 Calculation of Load Factor for Dynamic Moment

Equivalent load F_E at impact

$F_E = 1.4\upsilon a \times \delta \times m \times g = 1.4 \times 400 \times \frac{1}{100} \times 3.0 \times 9.8 = (N)$

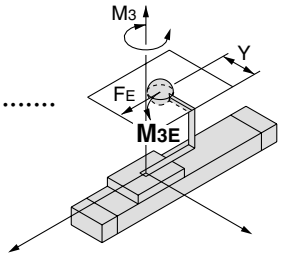


M_{1E}: Moment

M_{1E} max (from ④ of graph MY3M/M_1 where $1.4\upsilon a$ = 560 mm/s) = 5.71 (N•m) .....

$M_{1E} = \frac{1}{3} \times F_E \times Z = \frac{1}{3} \times 164.6 \times 20 \times 10^{-3} = 1.10$ (N•m)

Load factor $\alpha_4 = M_{1E}/M_{1E}$ max = 1.10/5.71 = **0.19**



M_{3E}: Moment

M_{3E} max (from ⑤ of graph MY3M/M_3 where $1.4\upsilon a$ = 560 mm/s) = 1.43 (N•m) .....

$M_{3E} = \frac{1}{3} \times F_E \times Y = \frac{1}{3} \times 164.6 \times 10 \times 10^{-3} = 0.55$ (N•m)

Load factor $\alpha_5 = M_{3E}/M_{3E}$ max = 0.55/1.43 = **0.38**

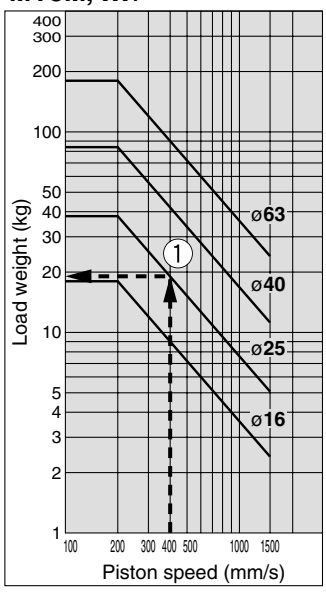
5 Sum and Examination of Guide Load Factors

$\Sigma\alpha = \alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 + \alpha_5 = 0.16 + 0.02 + 0.07 + 0.19 + 0.38 = 0.82 \leq 1$

The above calculation is within the allowable value, and therefore the selected model can be used.
Select a shock absorber separately.
In an actual calculation, when the sum of guide load factors $\Sigma\alpha$ in the formula above is more than 1, consider decreasing the speed, increasing the bore size, or changing the product series.

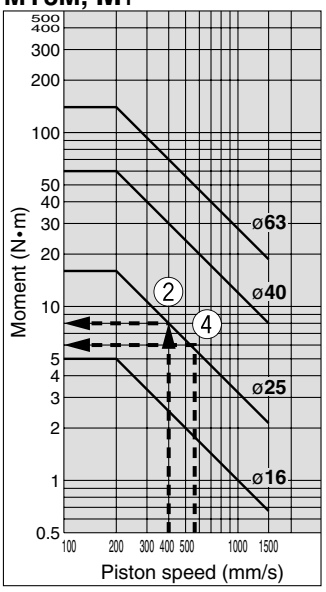
Load Weight

MY3M, m_1

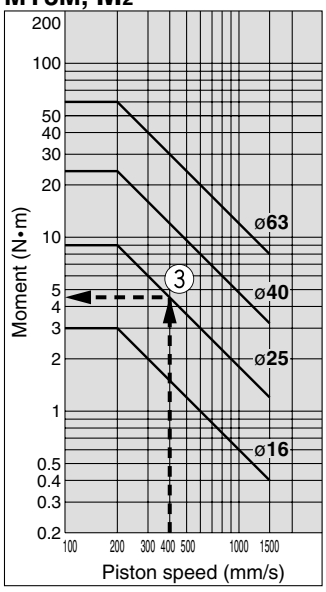


Allowable Moment

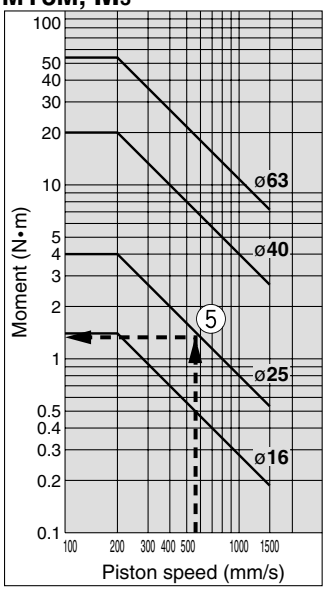
MY3M, M_1



MY3M, M_2



MY3M, M_3

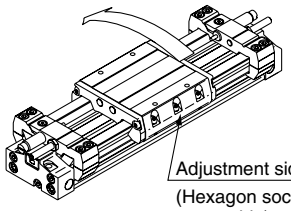


Maximum Allowable Moment / Maximum Allowable Load

Model	Bore size (mm)	Maximum allowable moment (N•m)			Maximum allowable load (kg)		
		M_1	M_2	M_3	m_1	m_2	m_3
MY3M	16	5	3	1.4	18	14	3
	25	16	9	4	38	36	8
	40	60	24	20	84	81	20
	63	140	60	54	180	163	40

∗ We recommend that the static M_2 moment direction should be as illustrated.
Also, when using the product in a wall mount application (m_3 applied), we recommend that the mounting orientation of the adjustment side (hexagon socket head button bolt side) should be in the upper position.

Recommended direction of applying M_2 moment

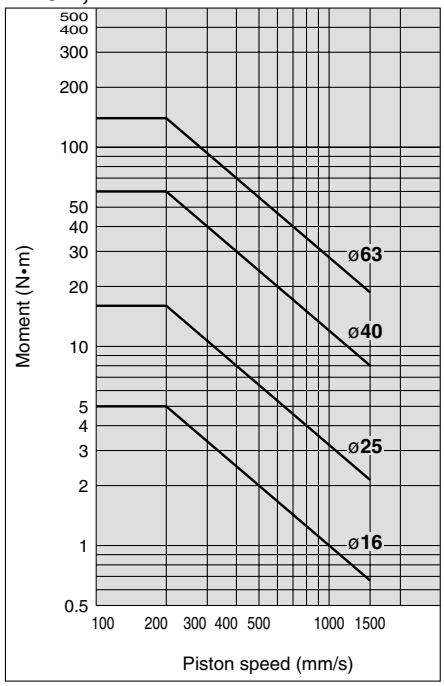


Adjustment side
(Hexagon socket button head screw side)

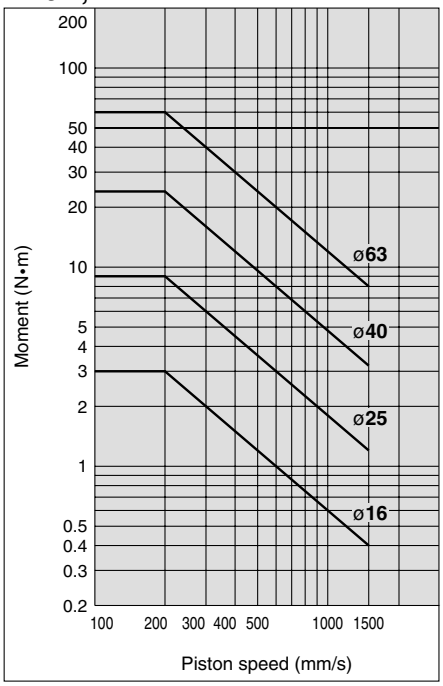
Maximum Allowable Moment

Select the moment from within the range of operating limits shown in the graphs. Note that the maximum allowable load value may sometimes be exceeded even within the operating limits shown in the graphs. Therefore, also check the allowable load for the selected conditions.

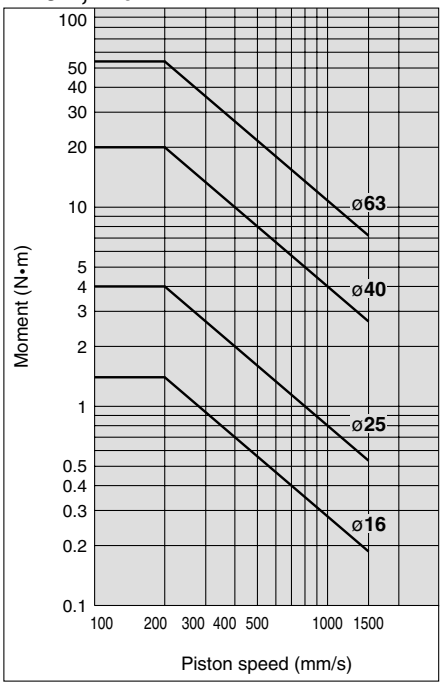
MY3M, M_1



MY3M, M_2



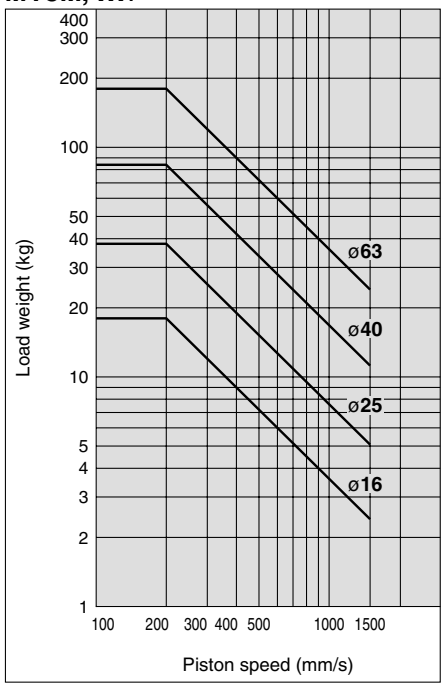
MY3M, M_3



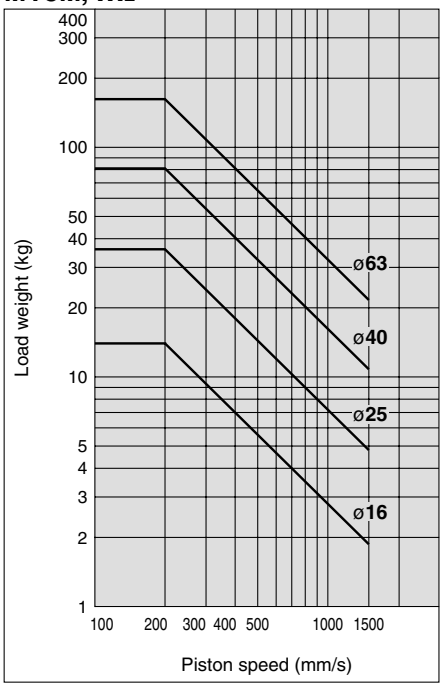
Maximum Allowable Load

Select the load from within the range of limits shown in the graphs. Note that the maximum allowable moment value may sometimes be exceeded even within the operating limits shown in the graphs. Therefore, also check the allowable moment for the selected conditions.

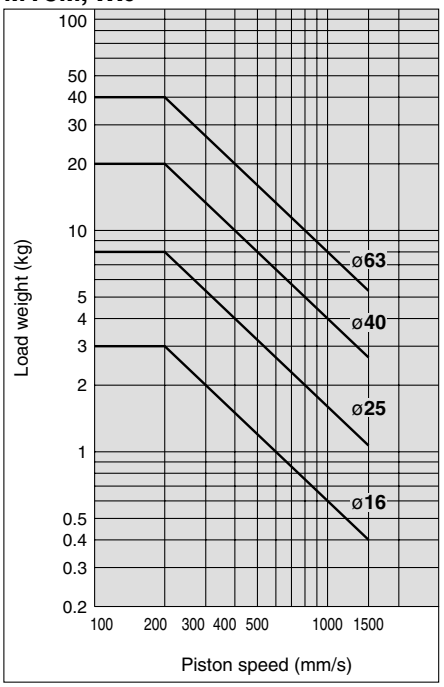
MY3M, m_1



MY3M, m_2



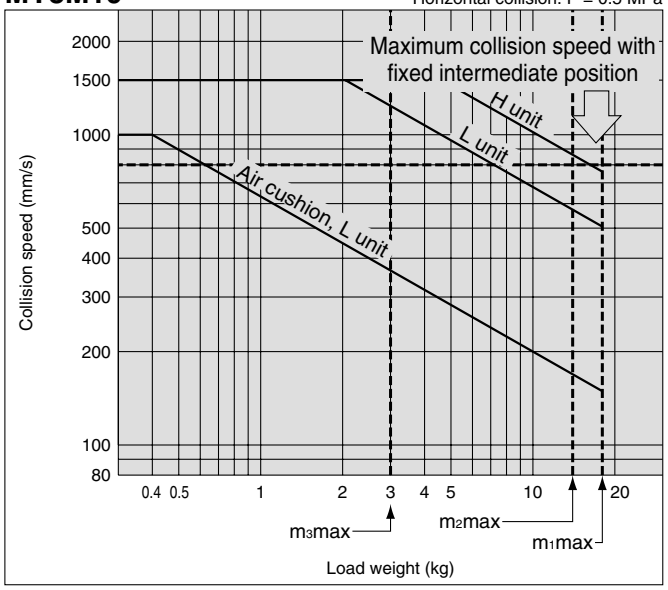
MY3M, m_3



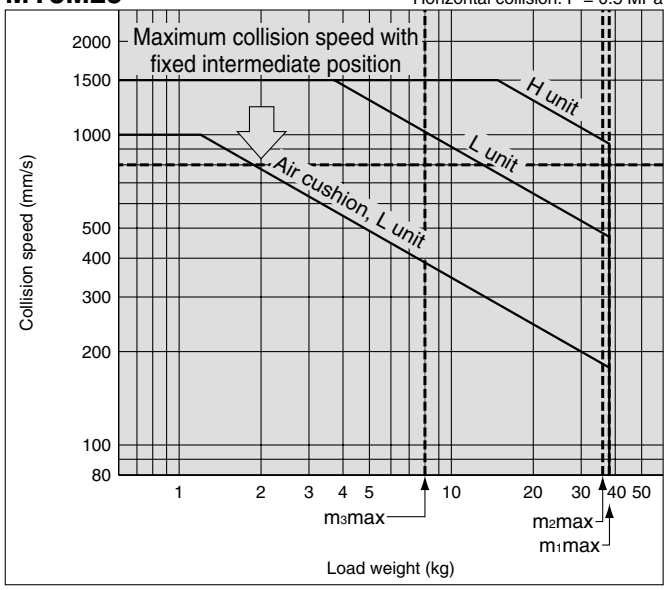
Cushion Capacity

Absorption Capacity of Air Cushion and Stroke Adjusting Unit

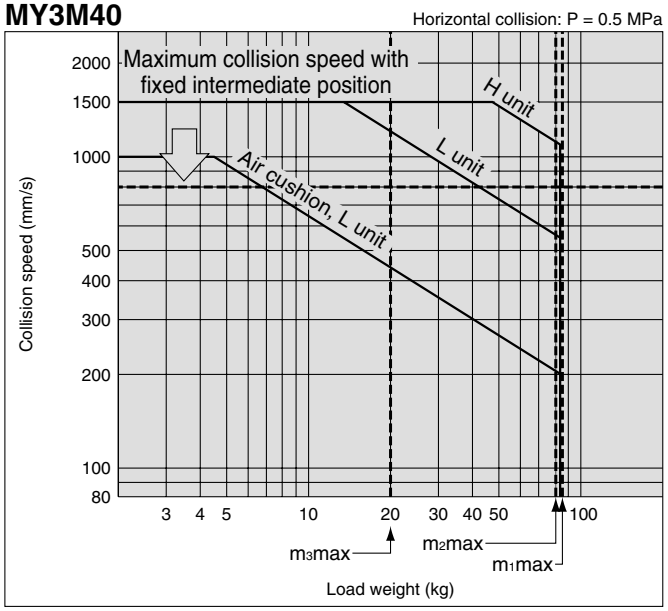
MY3M16



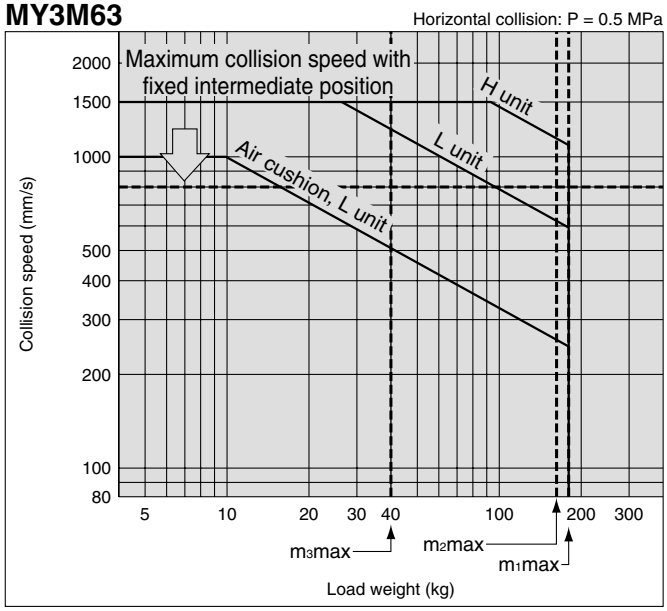
MY3M25



MY3M40



MY3M63



Air Cushion Stroke

Unit: mm

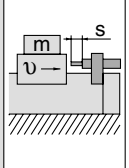
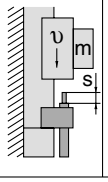
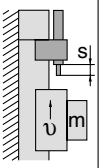
Bore size (mm)	Cushion stroke
16	13
25	18
40	25
63	30

Stroke Adjusting Unit Fine Stroke Adjustment Range

Unit: mm

Bore size (mm)	Fine stroke adjustment range (mm)
16	0 to -10
25	0 to -12
40	0 to -16
63	0 to -24

Note) The maximum operating speed will differ when the stroke adjusting unit is used outside the maximum fine stroke adjustment range (with reference to the fixed stroke end), such as at a fixed intermediate position (X416, X417). (Refer to the graph above.)

	Horizontal	Vertical (downward)	Vertical (upward)
Type of collision			
Kinetic energy E_1	$\frac{1}{2}m \cdot \upsilon^2$		
Thrust energy E_2	$F \cdot s$	$F \cdot s + m \cdot g \cdot s$	$F \cdot s - m \cdot g \cdot s$
Absorbed energy E	$E_1 + E_2$		

Symbols
- υ: Speed of impacting object (m/s)
- m: Weight of impacting object (kg)
- F: Cylinder thrust (N)
- g: Gravitational acceleration (9.8m/s²)
- s: Shock absorber stroke (m)

Note) The speed of the impacting object is measured at the time of collision with the shock absorber.

Mechanically Jointed Rodless Cylinder

Series MY3M

Slide Bearing Type: ø16, ø25, ø40, ø63

How to Order

Slide Bearing **MY3 M 16 □ — 300 LS — M9B □**

Slide bearing type

Cylinder bore size

16	16 mm
25	25 mm
40	40 mm
63	63 mm

Port thread type

Symbol	Type	Bore size
-	M thread	ø16
	Rc	ø25, ø40, ø63
TN	NPT	
TF	G	

Stroke

∗ Refer to "Standard Stroke" table.

Stroke adjusting unit

-	Without adjusting unit
L	With shock absorbers for low load on both sides
H	With shock absorbers for high load on both sides
LS	With a shock absorber for low load on left side
SL	With a shock absorber for low load on right side
HS	With a shock absorber for high load on left side
SH	With a shock absorber for high load on right side
LH	With L unit on left side and H unit on right side
HL	With H unit on left side and L unit on right side

Auto switch

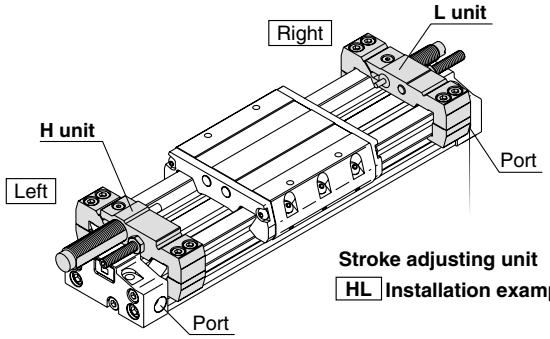
-	Without auto switch

∗ Refer to the table below for auto switch model numbers.
∗ Auto switches are shipped together, but not assembled.

Number of auto switches

-	2 pcs.
S	1 pc.
n	"n" pcs.

Stroke adjusting unit appearance and mounting direction



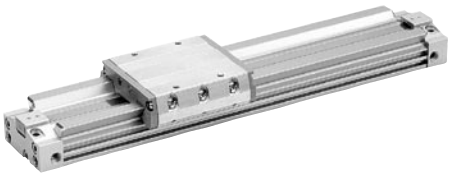
Stroke adjusting unit
HL **Installation example**

Applicable Auto Switches/ Refer to pages 29 to 33 for further information on auto switches.

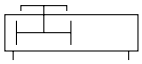
Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage DC	Load voltage AC	Auto switch model: Electrical entry: Perpendicular	Auto switch model: Electrical entry: In-line	Lead wire length (m)∗ 0.5 (-)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
Reed switch	—	Grommet	Yes	3-wire (NPN equiv.)	—	5 V	—	**A96V**	**A96**	●	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	**A93V**	**A93**	●	●	—	—	—	Relay, PLC
			—			5 V, 12 V	100 V or less	**A90V**	**A90**	●	●	—	—	IC circuit	
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V 12V	—	**M9NV**	**M9N**	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				**M9PV**	**M9P**	●	●	○	○		
				2-wire		12 V		**M9BV**	**M9B**	●	●	○	○	—	
	Diagnostic indication (2-colour indication)			3-wire (NPN)		5 V 12 V		**F9NWV**	**F9NW**	●	●	○	○	IC circuit	
				3-wire (PNP)				**F9PWV**	**F9PW**	●	●	○	○		
				2-wire		12 V		**F9BWV**	**F9BW**	●	●	○	○	—	

∗ Lead wire length symbols: 0.5 m..... - (Example) M9N
3 m..... L M9NL
5 m..... Z M9NZ

Note) ∗ Solid state switches marked with a "○" symbol are produced upon receipt of order.
∗ In addition to the models in the above table, there are some other auto switches that are applicable. For more information, please refer to page 28.



Symbol



Specifications

Bore size (mm)	16	25	40	63
Fluid	Air			
Action	Double acting			
Operating pressure range	0.15 to 0.7 MPa			
Proof pressure	1.05 MPa			
Ambient and fluid temperature	5 to 60°C			
Cushion	Air cushion			
Lubrication	Non-lube			
Stroke length tolerance	1000 mm or less $^{+1.8}_{0}$, From 1001 mm $^{+2.8}_{0}$			
Port size (Rc, NPT, G)	M5	1/8	1/4	3/8

Stroke Adjusting Unit Specifications

Bore size (mm)	16		25		40		63	
Unit symbol	L	H	L	H	L	H	L	H
Shock absorber model	RB0806	RB1007	RB1007	RB1412	RB1412	RB2015	RB2015	RB2725
Fine stroke adjustment range (mm)	0 to –10		0 to –12		0 to –16		0 to –24	

Piston Speed

Bore size (mm)	16	25	40	63
Without stroke adjusting unit	80 to 1000 mm/s			
Stroke adjusting unit (L and H unit)	80 to 1500 mm/s			
✻ **External shock absorber**	80 to 1500 mm/s			

✻ When the RB series is used, operate at a piston speed that will not exceed the absorption capacity of the air cushion and stroke adjusting unit.

Shock Absorber Specifications

Model		RB 0806	RB 1007	RB 1412	RB 2015	RB 2725
Max. energy absorption (J)		2.9	5.9	19.6	58.8	147
Stroke absorption (mm)		6	7	12	15	25
Max. collision speed (mm/s)		1500				
Max. operating frequency (cycle/min)		80	70	45	25	10
Spring force (N)	**Extended**	1.96	4.22	6.86	8.34	8.83
	Compressed	4.22	6.86	15.98	20.50	20.01
Operating temperature range (°C)		5 to 60				

Standard Stroke

Bore size (mm)	Standard stroke (mm)✻	Max. manufacturable stroke (mm)
16, 25 40, 63	100, 200, 300, 400, 500, 600 700, 800, 900, 1000, 1200 1400, 1600, 1800, 2000	3000

✻ Strokes are manufacturable in 1 mm increments, up to the maximum stroke. However, when exceeding 2000 mm stroke, add "-XB11" to the end of the model number. Refer to "Made to Order" on page 34.

Weight

Unit: kg

Model	Bore size (mm)	Basic weight	Additional weight per 50 mm stroke	Stroke adjusting unit weight (per unit)	
				L unit weight	H unit weight
MY3M	**16**	0.29	0.08	0.05	0.06
	25	0.90	0.21	0.12	0.17
	40	3.03	0.31	0.34	0.43
	63	8.63	0.68	0.69	0.91

Calculation method/Example: **MY3M25-400H**

Basic weight ····· 0.90 kg
Additional weight ····· 0.21/50 st
L unit weight ····· 0.17 kg

Cylinder stroke ····· 400 st

$0.90 + 0.21 \times 400 \div 50 + 0.17 \times 2 \approx 2.92$ kg

Theoretical Output

Unit: N

Bore size (mm)	Piston area (mm^2)	Operating pressure (MPa)						
		0.2	0.3	0.4	0.5	0.6	0.7	0.8
16	200	40	60	80	100	120	140	160
25	490	98	147	196	245	294	343	392
40	1256	251	377	502	628	754	879	1005
63	3115	623	934	1246	1557	1869	2180	2492

Note) Theoretical output (N) = Pressure (MPa) x Piston area (mm^2)

Option

Stroke Adjusting Unit Model

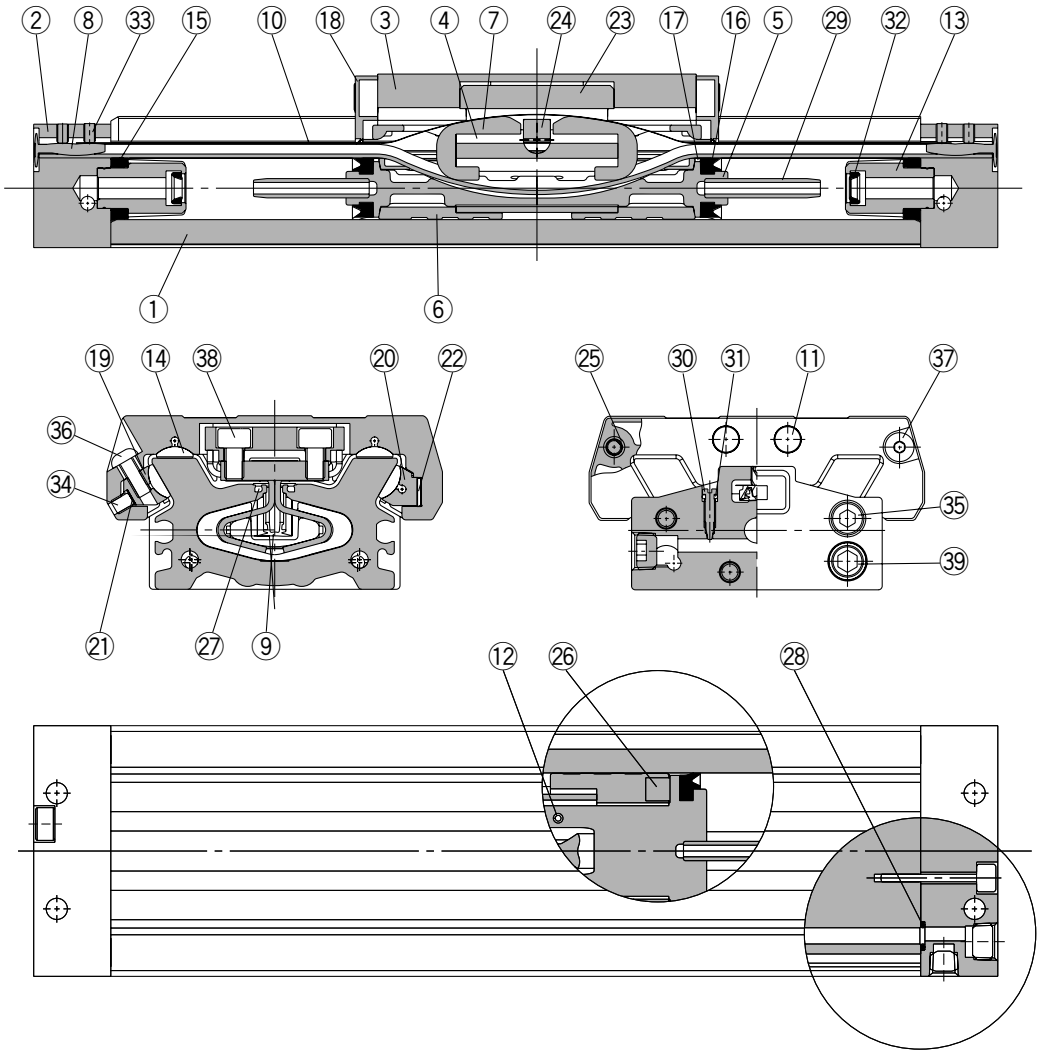
Model	Unit		Bore size (mm) 16	25	40	63
MY3M	**L unit**	Left	MY3M-A16L1	MY3M-A25L1	MY3M-A40L1	MY3M-A63L1
		Right	MY3M-A16L2	MY3M-A25L2	MY3M-A40L2	MY3M-A63L2
	H unit	Left	MY3M-A16H1	MY3M-A25H1	MY3M-A40H1	MY3M-A63H1
		Right	MY3M-A16H2	MY3M-A25H2	MY3M-A40H2	MY3M-A63H2

Made to Order

Refer to pages 34 to 35 regarding "Made to Order" for the MY3M series.

Construction

MY3M



Component Parts

No.	Description	Material	Note
1	**Cylinder tube**	Aluminum alloy	Hard anodized
2	**Head cover**	Aluminum alloy	Hard anodized
3	**Slide table**	Aluminum alloy	Hard anodized
4	**Piston yoke**	Stainless steel	
5	**Piston**	Aluminum alloy	Chromated
6	**Wear ring**	Special resin	
7	**Belt separator**	Special resin	
8	**Belt clamp**	Special resin	
11	**Stopper**	Carbon steel	Nickel plated
12	**Spring pin**	Carbon tool steel	
13	**Cushion boss**	Aluminum alloy	Chromated
14	**Bearing**	Special resin	
17	**Inner wiper**	Special resin	
18	**End cover**	Special resin	
19	**Adjust arm A**	Aluminum alloy	Chromated
20	**Adjust arm B**	Aluminum alloy	Chromated

Component Parts

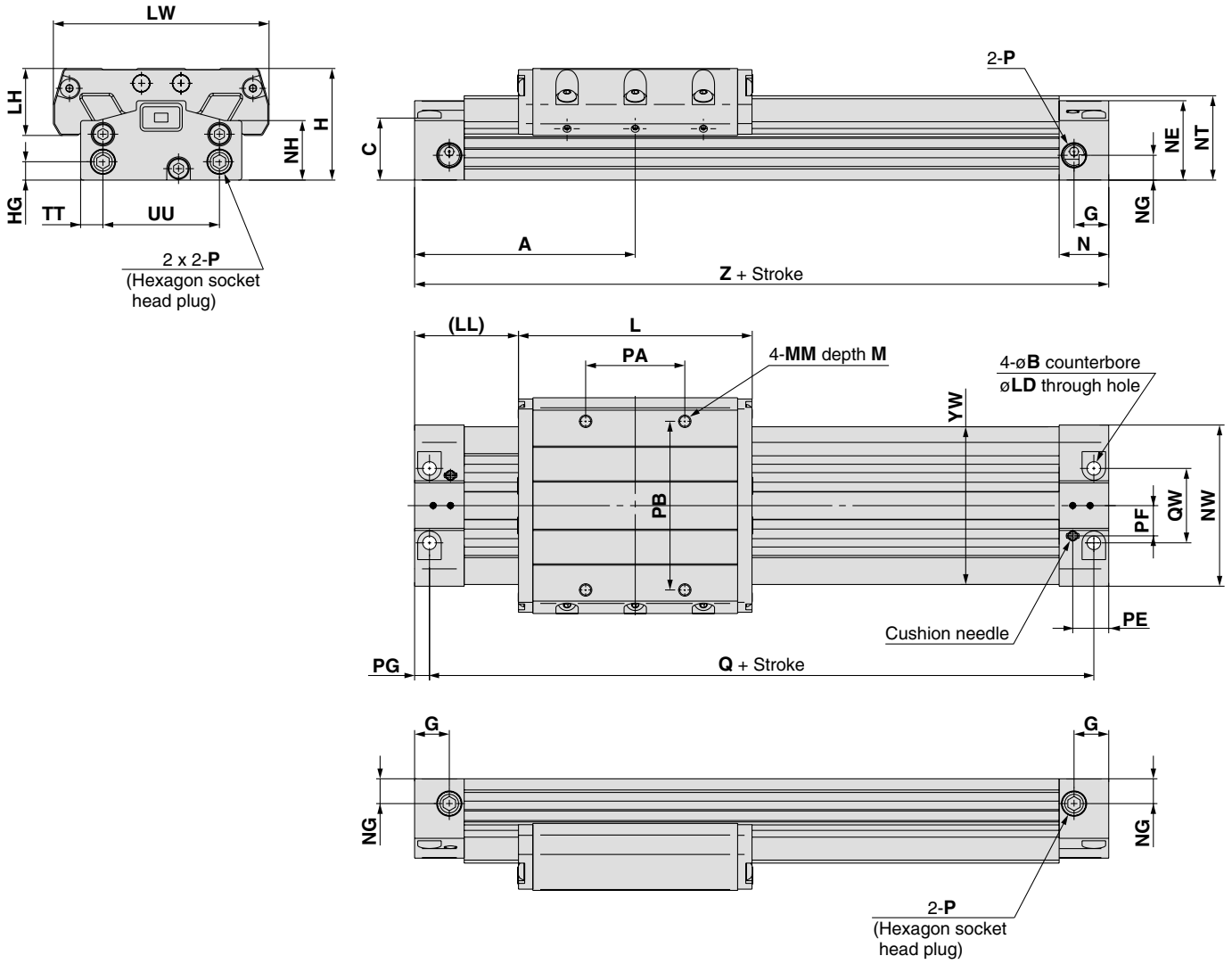
No.	Description	Material	Note
21	**Backup spring**	Stainless steel	
22	**Bearing adjusting rubber**	NBR	
23	**Coupler body**	Aluminum alloy	Hard anodized
24	**Coupler pin**	Carbon steel	Electroless nickel plated
25	**Spacer**	Stainless steel	
26	**Magnet**	Rare earth magnet	
27	**Seal magnet**	Rubber magnet	
29	**Cushion ring**	Brass	
30	**Cushion needle**	Rolled steel	Nickel plated
33	**Hexagon socket head set screw**	Chrome molybdenum steel	Nickel plated
34	**Hexagon socket head set screw**	Chrome molybdenum steel	Nickel plated
35	**Hexagon socket head cap screw**	Chrome molybdenum steel	Nickel plated
36	**Hexagon socket button head screw**	Chrome molybdenum steel	Nickel plated
37	**Hexagon socket button head screw**	Chrome molybdenum steel	Nickel plated
38	**Hexagon socket head cap screw**	Chrome molybdenum steel	Nickel plated
39	**Hexagon socket head plug**	Carbon steel	Nickel plated

Seal List

No.	Description	Material	Qty.	MY3M16	MY3M25	MY3M40	MY3M63
9	Seal belt	Special resin	1	MY3B16-16A-Stroke	MY3B25-16A-Stroke	MY3B40-16A-Stroke	MY3B63-16A-Stroke
10	Dust seal band	Stainless steel	1	MY3B16-16B-Stroke	MY3B25-16B-Stroke	MY3B40-16B-Stroke	MY3B63-16B-Stroke
15	Tubing gasket	NBR	2	RMB-16	RMB-25	RMB-40	RMB-63
16	Piston seal	NBR	2	RMY-16	RMY-25	RMY-40	RMY-63
28	O-ring	NBR	4	ø6.2 x ø3 x ø1.6	C-5	ø10.5 x ø8.5 x ø1	C-14
31	O-ring	NBR	2	ø4 x ø1.8 x ø1.1	ø4 x ø1.8 x ø1.1	ø7.15 x ø3.75 x ø1.7	ø8.3 x ø4.5 x ø1.9
32	Cushion seal	NBR	2	MCS-3	MCS-5	RCS-8	RCS-12

Slide Bearing Type: ø16, ø25, ø40, ø63

MY3M **Bore size** — **Stroke**



(mm)

Model	A	B	C	G	H	HG	L	LD	LH	LL	LW	M	MM	N	NE	NG
MY3M16	61	6	18	9.5	33	5	65	3.5	20.5	28.5	64	6	M4	13.5	22.5	8
MY3M25	89	9.5	25	14	45	7.4	95	5.5	27	41.5	87	10	M5	20	32	10
MY3M40	138	14	38	18	63	12	160	8.6	35	58	124	13	M6	27	46	15
MY3M63	178	17	60	20.5	93	16.5	220	11	46	68	176	15	M10	31	70	29

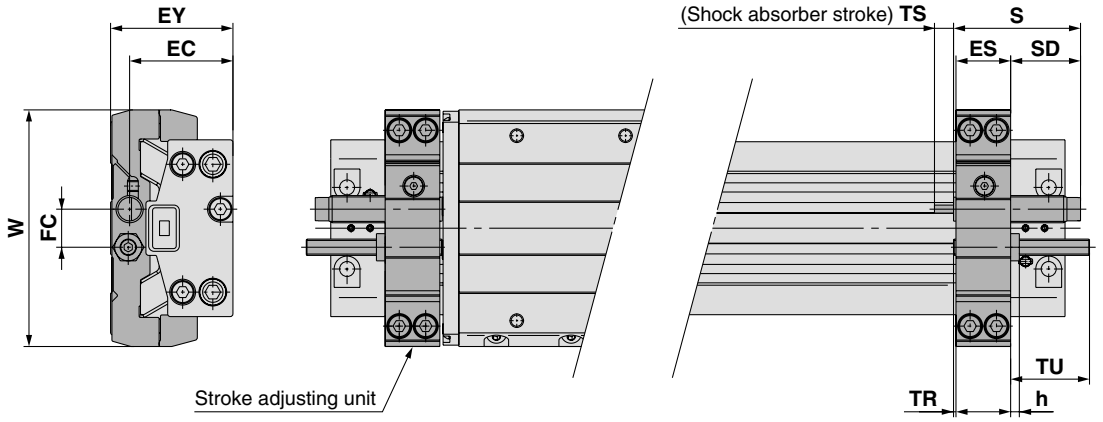
Model	NH	NT	NW	P	PA	PB	PE	PF	PG	Q	QW	TT	UU	YW	Z
MY3M16	17.2	24	43	M5	28	48	9.7	8.5	4	114	19	6.5	30	44.6	122
MY3M25	24	34	65	Rc, NPT, G1/8	40	68	14.5	12.2	6	166	30	9	47	63.6	178
MY3M40	37	49	94	Rc, NPT, G1/4	100	100	19.5	16.5	8.5	259	40	14	66	93.6	276
MY3M63	58	76	139	Rc, NPT, G3/8	130	150	23.5	27.5	10	336	64	20	99	138	356

Slide Bearing Type: ø16, ø25, ø40, ø63

Stroke adjusting unit

Shock absorber for low load + Adjusting bolt

MY3M Bore size — Stroke L



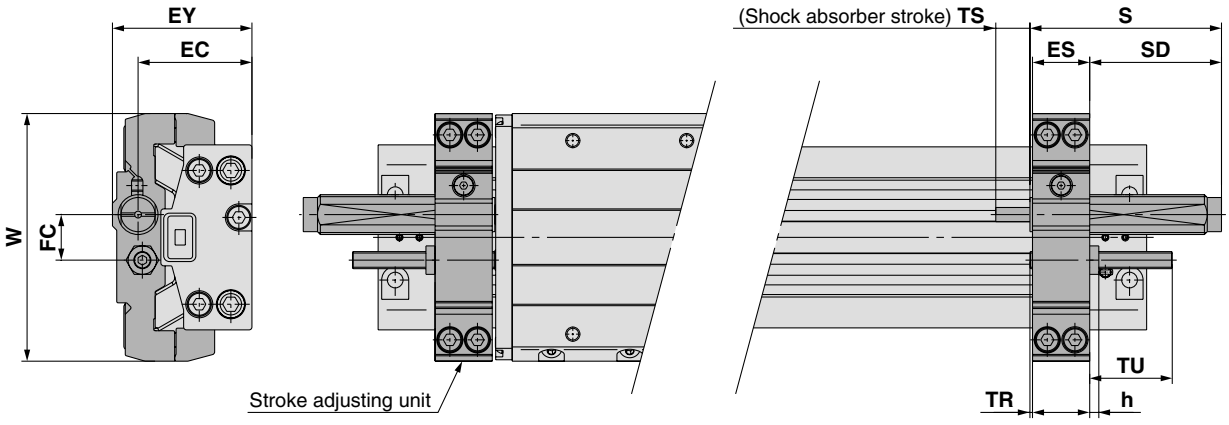
(mm)

Applicable cylinder	ES	EC	EY	FC	h	S	SD	TS	TR	TU	W	Shock absorber model
MY3M16	14.1	27.5	32.5	9	2.4	40.8	25.8	6	0.9	25	64	RB0806
MY3M25	20.1	38	44.5	14	3.6	46.7	25.2	7	1.4	28.5	87	RB1007
MY3M40	30.1	54	62.5	24	5	67.3	36.3	12	0.9	39	124	RB1412
MY3M63	36.1	81	92.5	32	6	73.2	36.2	15	0.9	43	176	RB2015

Note) When the stroke adjusting unit is used, the fitting type, which can be connected with the port on the body front and the back, will be limited.

Shock absorber for high load + Adjusting bolt

MY3M Bore size — Stroke H



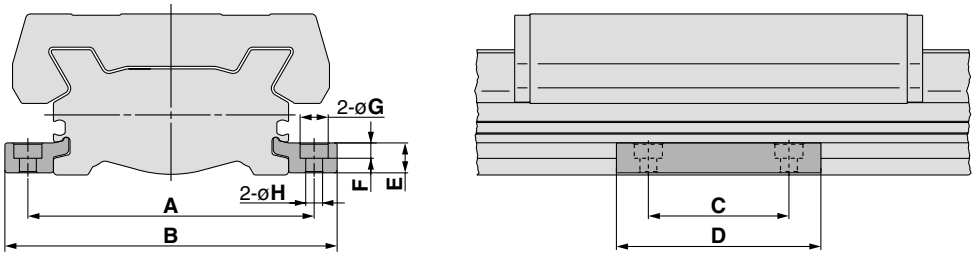
(mm)

Applicable cylinder	ES	EC	EY	FC	h	S	SD	TS	TR	TU	W	Shock absorber model
MY3M16	14.1	28.5	34.5	11	2.4	46.7	31.7	7	0.9	25	64	RB1007
MY3M25	20.1	40	49	16	3.6	67.3	45.8	12	1.4	28.5	87	RB1412
MY3M40	30.1	57	69	26	5	73.2	42.2	15	0.9	39	124	RB2015
MY3M63	36.1	84.5	100	32	6	99	62	25	0.9	43	176	RB2725

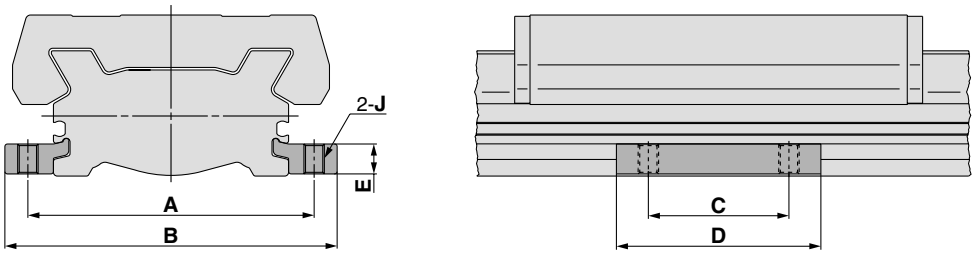
Note) When the stroke adjusting unit is used, the fitting type, which can be connected with the port on the body front and the back, will be limited.

Side Support

Side support A
MY-S□A



Side support B
MY-S□B

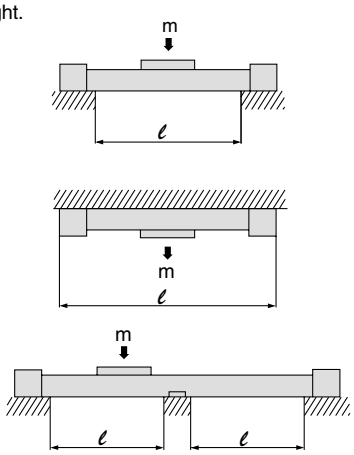


(mm)

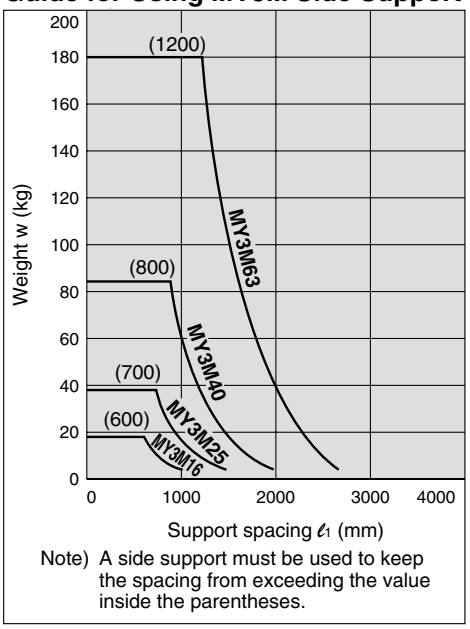
Model	Applicable cylinder	A	B	C	D	E	F	G	H	J
MY-S16 A/B	MY3M16	53	63.6	15	26	4.9	3	6.5	3.4	M4
MY-S25 A/B	MY3M25	77	91	35	50	8	5	9.5	5.5	M6
MY-S32 A/B	MY3M40	112	130	45	64	11.7	6	11	6.6	M8
MY-S40 A/B	MY3M63	160	182	55	80	14.8	8.5	14	9	M10

Guide for Using Side Support

For long stroke operation, the cylinder tube may be deflected depending on its own weight and the load weight. In such a case, use a side support in the middle section. The spacing (ℓ) of the support must be no more than the values shown in the graph on the right.



Guide for Using MY3M Side Support



Note) A side support must be used to keep the spacing from exceeding the value inside the parentheses.

⚠ Caution

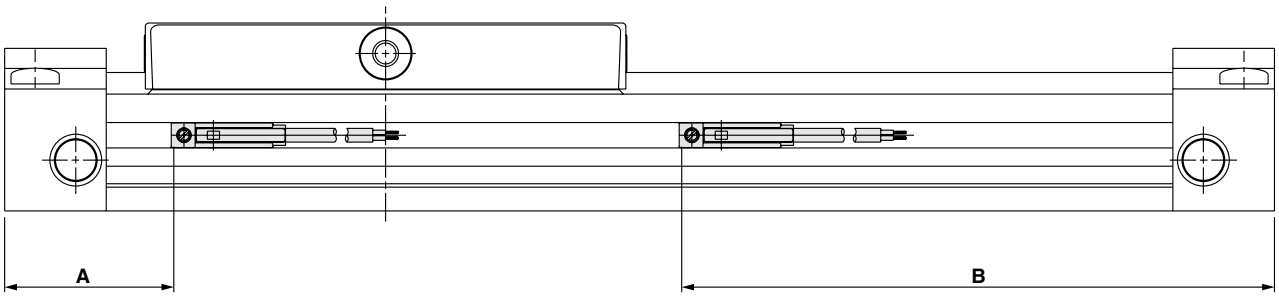
① If the cylinder mounting surfaces are not measured accurately, using a side support may cause poor operation. Therefore, be sure to level the cylinder tube when mounting. Also, for long stroke operation involving vibration and impact, use of a side support is recommended even if the spacing value is within the allowable limits shown in the graph.

② Support brackets are not for mounting; use them solely for providing support.

Auto Switch Specifications

Auto Switch Proper Mounting Position (for Stroke End Detection)

Note) The operating ranges are provided as guidelines including the hysteresis and are not guaranteed values (with approx. ±30% variations). They may vary significantly with the surrounding environment.



MY3A

D-A9/D-A9□V (mm)

Bore size	A	B	Operating range
16	22	88	6.5
25	29	121	10.5
40	42.5	197.5	15
63	53.5	266.5	14

D-F9□W/D-F9□WV (mm)

Bore size	A	B	Operating range
16	26	84	3.0
25	33	117	4.5
40	46.5	193.5	6.3
63	57.5	262.5	6.6

D-M9□/D-M9□V (mm)

Bore size	A	B	Operating range
16	26	84	2
25	33	117	3
40	46.5	193.5	4
63	57.5	262.5	4.5

MY3B/MY3M

D-A9/D-A9□V (mm)

Bore size	A	B	Operating range
16	28	94	6.5
25	43	135	10.5
40	60.5	215.5	15
63	71.5	284.5	14

D-F9□W/D-F9□WV (mm)

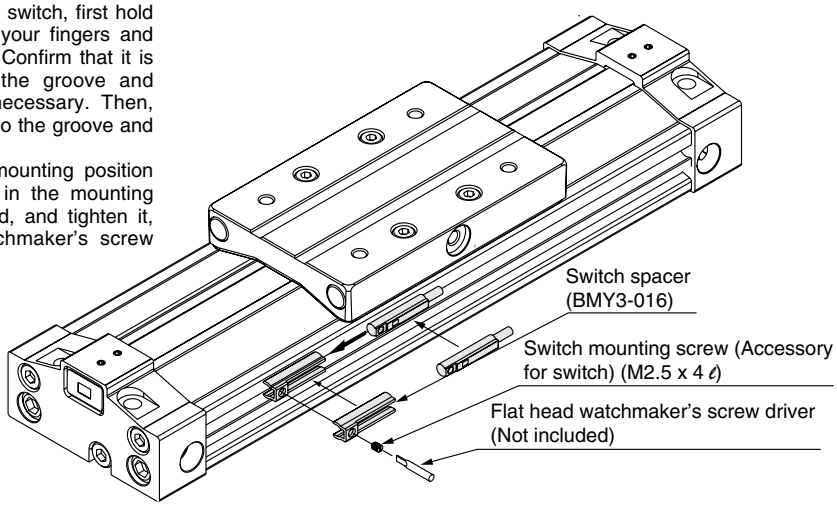
Bore size	A	B	Operating range
16	32	90	3.0
25	47	131	4.5
40	64.5	211.5	6.3
63	75.5	280.5	6.6

D-M9□/D-M9□V (mm)

Bore size	A	B	Operating range
16	32	90	2
25	47	131	3
40	64.5	211.5	4
63	75.5	280.5	4.5

Auto Switch Mounting

When mounting an auto switch, first hold the switch spacer with your fingers and push it into the groove. Confirm that it is aligned evenly within the groove and adjust the position if necessary. Then, insert the auto switch into the groove and slide it into the spacer.
After deciding on the mounting position within the groove, slip in the mounting screw, which is included, and tighten it, using a flat head watchmaker's screw driver.



Note) Use a watchmaker's screw driver with a handle diameter of 5 to 6 mm to fasten the auto switch mounting screws.
The tightening torque should be approximately 0.1 to 0.15 N·m.
The guideline is a 90° rotation after the fastening is felt.

Switch Spacer (mm)

Applicable bore size (mm)	16	25	40	63
Switch spacer	BMY3-016			

Besides the models listed in "How to Order", the following auto switches are applicable.
Refer to SMC's Best Pneumatics Catalogue for details.

Type	Model	Lead wire electrical entry	Output type	Features
Solid state switch	**D-F9G**	Grommet (in-line)	NPN	Normally closed (NC = b contact)
	D-F9H		PNP	

Auto Switch Specifications

Type	Reed switch	Solid state switch
Leakage current	None	3-wire: 100 μA or less, 2-wire: 0.8 mA or less
Operating time	1.2 ms	1ms or less
Impact resistance	300 m/s^2	1000 m/s^2
Insulation resistance	50 MΩ or more at 500 VDC Mega (between lead wire and case)	
Withstand voltage	1000 VAC for 1 min. (between lead wire and case)	
Ambient temperature	−10 to 60°C	
Enclosure	IEC60529 standard IP67, waterproof (JIS C 0920)	

Lead Wire Length

Lead wire length indication

(Example) **D-M9P[L]**

Lead wire length

-	0.5 m
L	3 m
Z Note 1)	5 m

Note 1) Lead wire length "Z" (5 m applicable auto switches) is as follows.
Reed auto switch: Not available
Solid state switch: All types are produced upon receipt of order.

Note 2) For solid state switches with flexible wire specification, add "−61" at the end of the lead wire length.

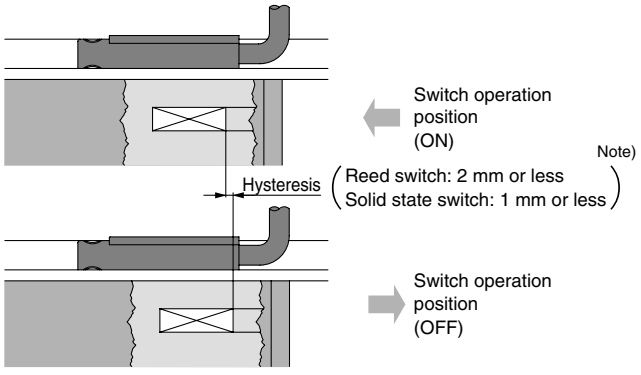
∗ Oil resistant flexible heavy-duty cord is used for D-M9□ as standard. No need to suffix -61 to the end of part number.

(Example) D-F9PWVL-[61]

Flexible specification

Auto Switch Hysteresis

The hysteresis is the difference between the position of the auto switch as it turns "on" and as it turns "off". A part of operating range (one side) includes this hysteresis.



Note) Hysteresis may fluctuate due to the operating environment. Please contact SMC if hysteresis causes an operational problem.

Contact Protection Box/CD-P11, CD-P12

〈Applicable switch model〉

D-A9 and D-A9□V type switches do not have internal contact protection circuits.

A contact protection box should be used in any of the following situations.

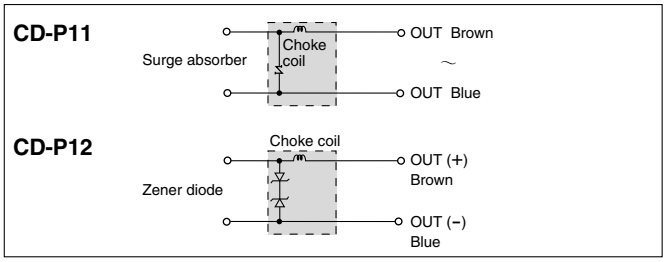
① **The operated load is an induction load.**
② **The length of wiring to the load is 5 m or more.**
③ **The load voltage is 100 VAC.**

Contact Protection Box Specifications

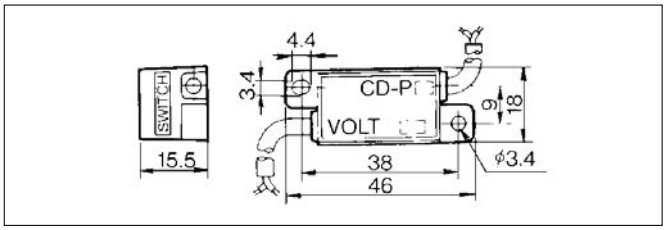
Part no.	CD-P11		CD-P12
Load voltage	100 VAC	200 VAC	24 VDC
Max. load current	25 mA	12.5 mA	50 mA

∗ Lead wire length —— Switch connection side: 0.5 m
Load connection side: 0.5 m

Contact Protection Box Internal Circuit



Contact Protection Box Dimensions



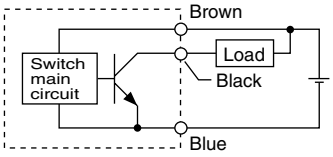
Contact Protection Box/Connection

To connect a switch unit to a contact protection box, connect the lead wire from the side of the contact protection box marked SWITCH to the lead wire coming out of the switch unit. The switch unit should be kept as close as possible to the contact protection box with a lead wire that is no more than 1 metre in length.

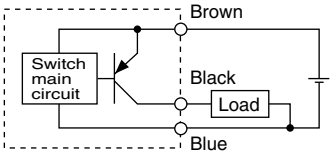
Series MY3
Auto Switch Connections and Examples

Basic Wiring

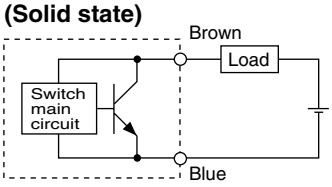
Solid state 3-wire, NPN



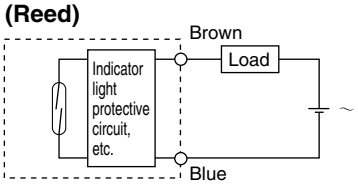
Solid state 3-wire, PNP



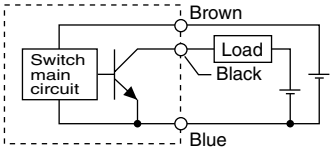
2-wire (Solid state)

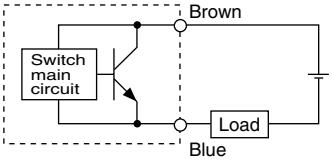


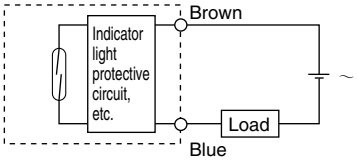
2-wire (Reed)



(Power supplies for switch and load are separate.)

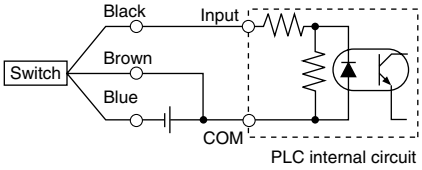




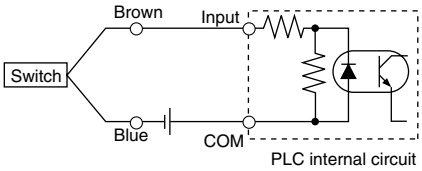


Examples of Connection to PLC (Programmable Logic Controller)

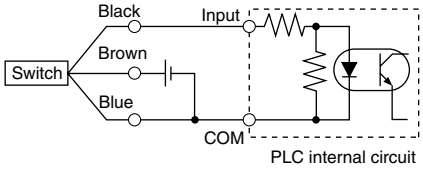
• Sink input specifications
3-wire, NPN



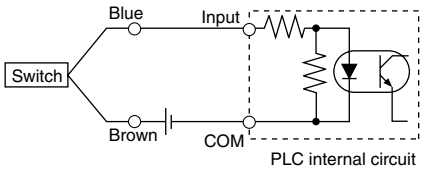
2-wire



• Source input specifications
3-wire, PNP



2-wire

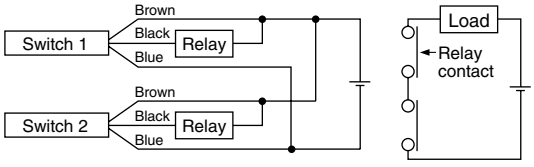


Connect according to the applicable PLC input specifications, as the connection method will vary depending on the PLC input specifications.

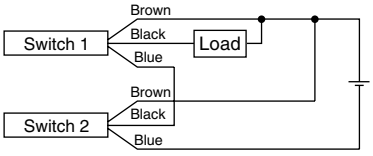
Examples of AND (Series) and OR (Parallel) Connection

● **3-wire (using relays)**

AND connection for NPN output (using relays)

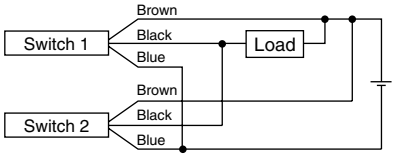


AND connection for NPN output (performed with switches only)

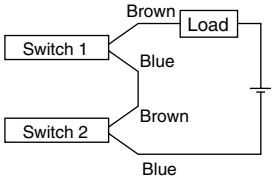


The indicator light illuminates when the two switches are in the ON state.

OR connection for NPN output



2-wire with 2-switch AND connection

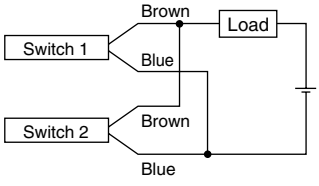


When two switches are connected in series, a load may malfunction because the load voltage will decline when in the ON state. The indicator lights will light when both switches are in the ON state.

Load voltage at ON = Power supply voltage – Internal voltage drop × 2 pcs.
= 24 V–4 V × 2 pcs.
= 16 V

Example: Power supply is 24 VDC
Internal voltage drop in switch is 4 V.

2-wire with 2-switch OR connection



< Solid state >

When two switches are connected in parallel, malfunction may occur because the load voltage will increase when in the OFF state.

< Reed>

Because there is no current leakage, the load voltage will not increase when turned OFF However, depending on the number of switches in the ON state, the indicator lights may sometimes grow dim or not light up because of the dispersion and reduction of the current flowing to the switches.

Load voltage at OFF = Leakage current × 2 pcs. × Load impedance
= 1 mA × 2 pcs. × 3 kΩ
= 6 V

Example: Load impedance is 3 kΩ.
Leakage current from switch is 1 mA.

Reed Switch: Direct Mounting Style
D-A90(V)/D-A93(V)/D-A96(V)

Grommet
Electrical entry: In-line

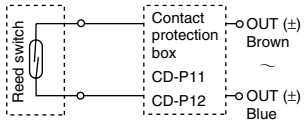
⚠ Caution

Operating Precautions

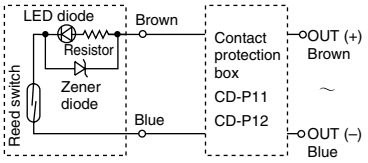
Do not use anything other than the mounting screws attached to the auto switch body to secure the switch. If screws other than those specified are used, it may cause the switch to be damaged.

Auto Switch Internal Circuit

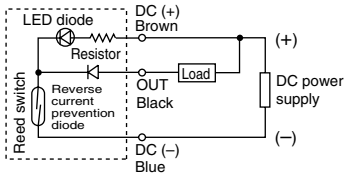
D-A90(V)



D-A93(V)



D-A96(V)



Note) 1. In the case operation load is an inductive load.
2. In the case the wiring length to load is more than 5 m.
3. In the case the load voltage is 100 VAC.

A contact protection box should be used if any of the above conditions is applicable. (For detailed information about the contact protection box, please refer to page 29.)

Auto Switch Specifications

For details about certified products conforming to international standards, visit us at www.smcworld.com.

PLC: Programmable Logic Controller

D-A90/D-A90V (Without indicator light)			
Auto switch part no.	**D-A90/D-A90V**		
Applicable load	IC circuit, Relay, PLC		
Load voltage	24 V AC/DC or less	48 V AC/DC or less	100 V AC/DC or less
Maximum load current	50 mA	40 mA	20 mA
Contact protection circuit	None		
Internal resistance	1 Ω or less (including lead wire length of 3 m)		

D-A93/D-A93V/D-A96/D-A96V (With indicator light)			
Auto switch part no.	**D-A93/D-A93V**		**D-A96/D-A96V**
Applicable load	Relay, PLC		IC circuit
Load voltage	24 VDC	100 VAC	4 to 8 VDC
Load current range and max. load current Note 3)	5 to 40 mA	5 to 20 mA	20 mA
Contact protection circuit	None		
Internal voltage drop	D-A93 — 2.4 V or less (to 20 mA)/ 3 V or less (to 40 mA) D-A93V — 2.7 V or less		0.8 V or less
Indicator light	Red LED illuminates when turned ON.		

● Lead wires
Oilproof vinyl heavy-duty cord, ø2.7, 0.5 m
D-A90(V)/D-A93(V) 0.18 mm² x 2 cores (Brown, Blue)
D-A96(V) 0.15 mm² x 3 cores (Brown, Black, Blue)

Note 1) Refer to page 29 for reed switch common specifications.
Note 2) Refer to page 29 for lead wire lengths.
Note 3) In less than 5 mA condition, the indicating light visibility becomes low, and it may be unreadable in less than 2.5 mA. However, as long as the contact ouput is over a 1 mA condition, there will be no problem.

Weight

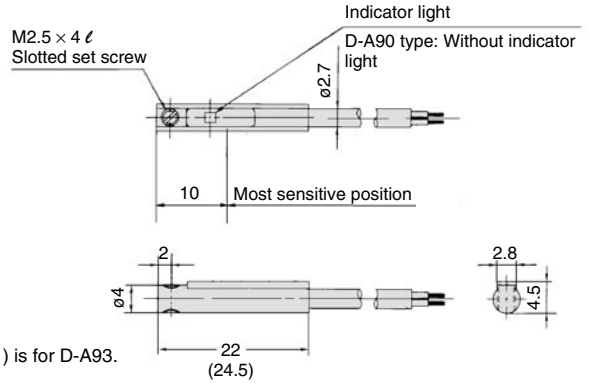
Unit: g

Model	D-A90	D-A90V	D-A93	D-A93V	D-A96	D-A96V
Lead wire length: 0.5 m	6	6	6	6	8	8
Lead wire length: 3 m	30	30	30	30	41	41

Dimensions

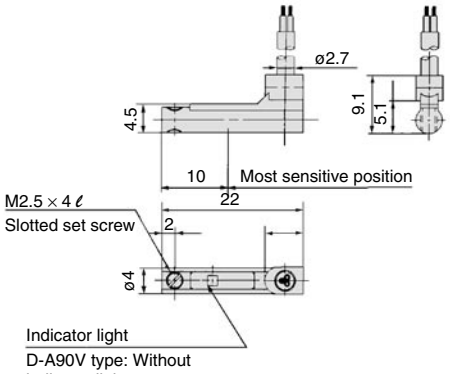
Unit: mm

D-A90/D-A93/D-A96



The dimension inside ( ) is for D-A93.

D-A90V/D-A93V/D-A96V



Solid State Switch: Direct Mounting Style
D-M9N(V)/D-M9P(V)/D-M9B(V) CE

Grommet

- **2-wire load current is reduced (2.5 to 40 mA)**
- **Lead-free**
- **UL certified (style 2844) lead cable is used.**

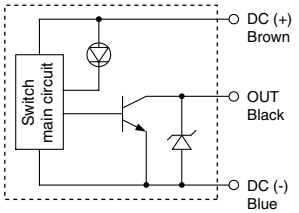
⚠ Caution

Operating Precautions

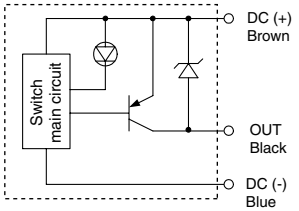
Do not use anything other than the mounting screws attached to the auto switch body to secure the switch. If screws other than those specified are used, it may cause the switch to be damaged.

Auto Switch Internal Circuit

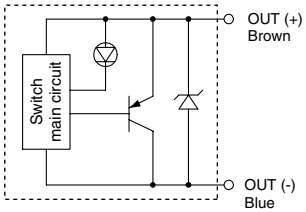
D-M9N(V)



D-M9P(V)



D-M9B(V)



Auto Switch Specifications

For details about certified products conforming to international standards, visit us at www.smcworld.com.

PLC: Programmable Logic Controller

D-M9□, D-M9□V (With indicator light)						
Auto switch part no.	D-M9N	D-M9NV	D-M9P	D-M9PV	D-M9B	D-M9BV
Electrical entry direction	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular
Wiring type	3-wire				2-wire	
Output type	NPN		PNP		—	
Applicable load	IC circuit, Relay, PLC				24 VDC relay, PLC	
Power supply voltage	5, 12, 24 VDC (4.5 to 28 VDC)				—	
Current consumption	10 mA or less				—	
Load voltage	28 VDC or less		—		24 VDC (10 to 28 VDC)	
Load current	40 mA or less				2.5 to 40 mA	
Internal voltage drop	80 V or less				4 V or less	
Leakage current	100 μA or less at 24 VDC				0.8 mA or less	
Indicator light	Red LED illuminates when turned ON.					

● Lead wires
Oilproof vinyl heavy-duty cord, 2.7 x 3.2 ellipse
D-M9B(V) 0.15 mm² x 2 cores
D-M9N(V)/D-M9P(V) 0.15 mm² x 3 cores

Note 1) Refer to page 29 for solid state switch common specifications.
Note 2) Refer to page 29 for lead wire lengths.

Weight

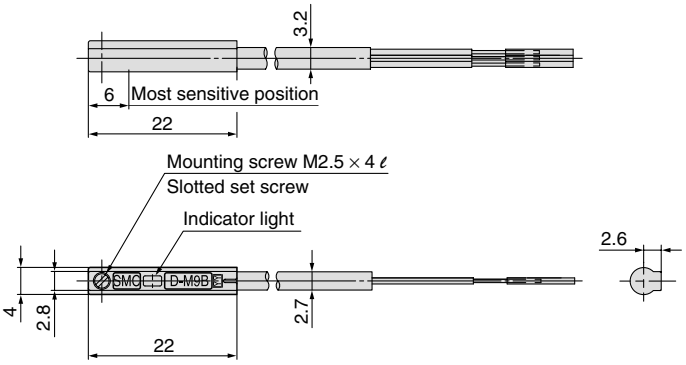
Unit: g

Model		D-M9N(V)	D-M9P(V)	D-M9B(V)
Lead wire length (m)	0.5	8	8	7
	3	41	41	38
	5	68	68	63

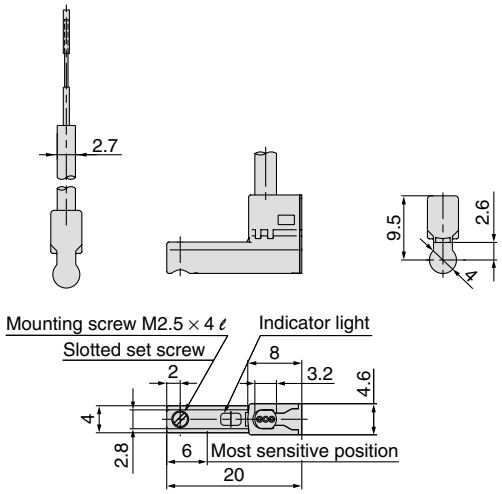
Dimensions

Unit: mm

D-M9□



D-M9□V



SMC

2-colour Indication, Solid State Switch: Direct Mounting Style
D-F9NW(V)/D-F9PW(V)/D-F9BW(V)

Grommet

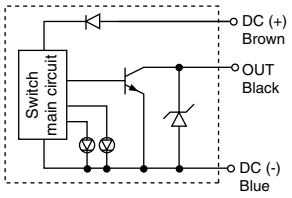
⚠ Caution

Operating Precautions

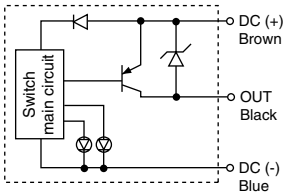
Do not use anything other than the mounting screws attached to the auto switch body to secure the switch. If screws other than those specified are used, it may cause the switch to be damaged.

Auto Switch Internal Circuit

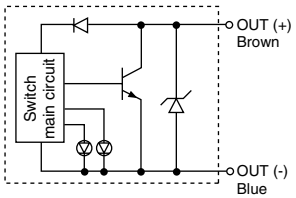
D-F9NW(V)



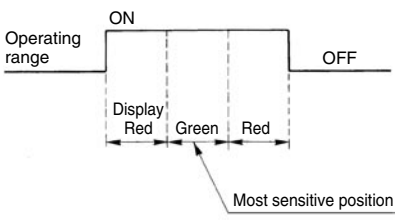
D-F9PW(V)



D-F9BW(V)



Indicator light



Auto Switch Specifications

For details about certified products conforming to international standards, visit us at www.smcworld.com.

PLC: Programmable Logic Controller

D-F9□W/D-F9□WV (With indicator light)						
Auto switch part no.	D-F9NW	D-F9NWV	D-F9PW	D-F9PWV	D-F9BW	D-F9BWV
Electrical entry direction	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular
Wiring type	3-wire				2-wire	
Output type	NPN		PNP		—	
Applicable load	IC circuit, Relay IC, PLC				24 VDC relay, PLC	
Power supply voltage	5, 12, 24 VDC (4.5 to 28 VDC)				—	
Current consumption	10 mA or less				—	
Load voltage	28 VDC or less		—		24 VDC (10 to 28 VDC)	
Load current	40 mA or less		80 mA or less		5 to 40 mA	
Internal voltage drop	1.5 V or less (0.8 V or less at 10 mA load current		0.8 V or less		4 V or less	
Leakage current	100 μA or less at 24 VDC				0.8 mA or less	
Indicator light	Operating position ..... Red LED illuminates. Optimum operating position ..... Green LED illuminates.					

● Lead wires
Oilproof vinyl heavy-duty cord, ø2.7, 0.5 m
0.15 mm² x 3 cores (Brown, Black, Blue)
0.18 mm² x 2 cores (Brown, Blue)

Note 1) Refer to page 29 for solid state switch common specifications.
Note 2) Refer to page 29 for lead wire lengths.

Weight

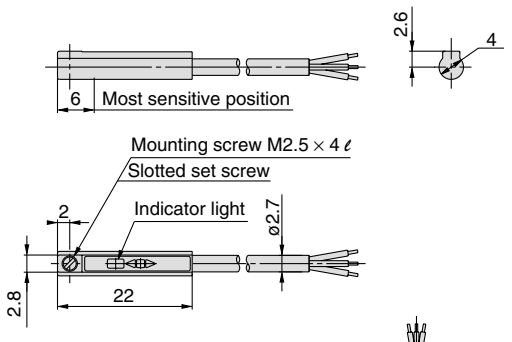
Unit: g

Model		D-F9NW(V)	D-F9PW(V)	D-F9BW(V)
Lead wire length (m)	0.5	7	7	7
	3	34	34	32
	5	56	56	52

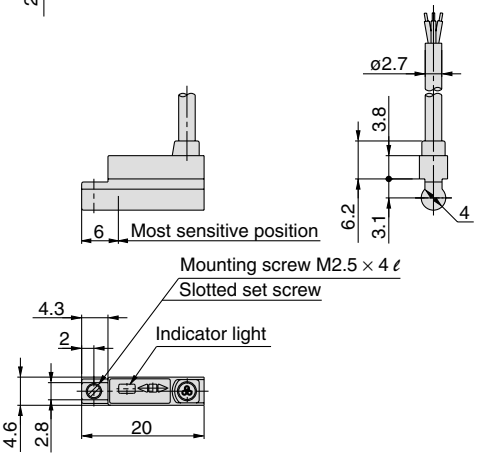
Dimensions

Unit: mm

D-F9□W



D-F9□WV



Series MY3
Made to Order 1

Please contact SMC for detailed dimensions, specifications and delivery lead times.

Made to Order

Made to Order Application List

Series	Type	Long stroke	Helical insert threads	Holder mounting bracket	Copper-free
		XB11	X168	X416/X417	20-
MY3A	Basic short type	●	●	—	●
MY3B	Basic standard type	●	●	●	●
MY3M	Slide bearing type	●	●	●	●

1 Long stroke -XB11

Available with long strokes exceeding the standard strokes. The stroke can be set in 1 mm increments.

■ **Stroke range: 2001 to 3000 mm**

MY3 **A** Bore size — Stroke — Auto switch Symbol **–XB11**

- Stroke adjusting unit (∗ MY3B and MY3M only)
- Port thread type
- Type/Bore size

		16	25	40	63
A	Basic short type	●	●	●	●
B	Basic standard type	●	●	●	●
M	Slide bearing type	●	●	●	●

Example) MY3A40-2700-M9B-XB11

2 Helical insert threads -X168

The mounting threads of the slider are changed to helical insert threads. The thread size is the same as standard.

MY3 **B** Bore size — Stroke — Auto switch Symbol **–X168**

- Stroke adjusting unit (∗ MY3B and MY3M only)
- Port thread type
- Type/Bore size

		16	25	40	63
A	Basic short type	●	●	●	●
B	Basic standard type	●	●	●	●
M	Slide bearing type	●	●	●	●

Example) MY3B16-300L-M9B-X168

3 Holder mounting bracket ..... ①, ② -X416/X417

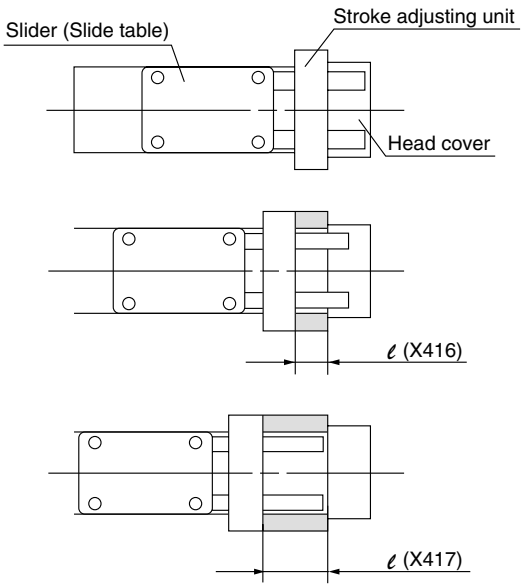
Holder mounting brackets are used to fasten the stroke adjusting unit at an intermediate stroke position.

Holder mounting bracket ① ..... -X416 Holder mounting bracket ② ..... -X417

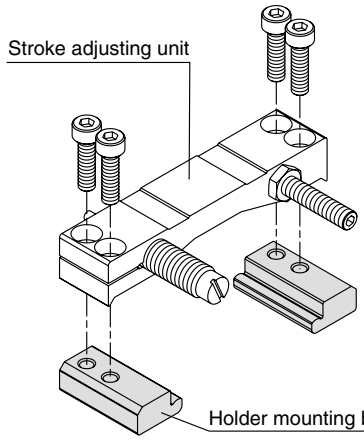
Fine Stroke Adjustment Range

(Treated as a special order when exceeding the adjustment ranges shown below.) Unit: mm

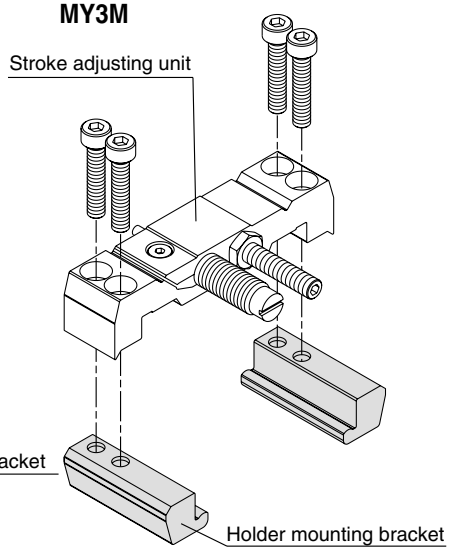
Bore size (mm)	-X416 (one side)		-X417 (one side)	
	Spacer Length (ℓ)	Adjustment range MY3B/MY3M	Spacer Length (ℓ)	Adjustment range MY3B/MY3M
16	10	–10 to –20	20	–20 to –30
25	12	–12 to –24	24	–24 to –36
40	16	–16 to –32	32	–32 to –48
63	24	–24 to –48	48	–48 to –72



MY3B



MY3M



SMC

Series MY3
Made to Order 2

Please contact SMC for detailed dimensions, specifications and delivery lead times.

Made to Order

3 Holder mounting bracket ..... ①, ② -X416/X417

MY3 B Bore size – 300 L – X416 □

- **Combination symbol**
  Refer to the table below for applicable symbols.
- **Holder mounting bracket**
  Refer to the table below for applicable symbols.
- **Stroke adjusting unit**
  Refer to the table below for applicable symbols.
- **Stroke**
  Note) Indicates the stroke prior to mounting the stroke adjusting unit.
- **Type/Bore size**

		16	25	40	63
B	Basic standard type	●	●	●	●
M	Slide bearing type	●	●	●	●

Stroke adjustment range

0 –10 –20 –30 –40 –50 –60 –70 –80

MY3□16	L unit	0 to 10	10 to 20	20 to 30
	H unit	Standard	-X416	-X417
MY3□25	L unit	0 to 12	12 to 24	24 to 36
	H unit	Standard	-X416	-X417
MY3□40	L unit	0 to 16	16 to 32	32 to 48
	H unit	Standard	-X416	-X417
MY3□63	L unit	0 to 24	24 to 48	48 to 72
	H unit	Standard	-X416	-X417

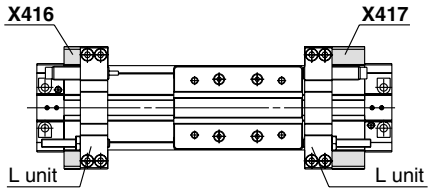
Stroke adjusting unit	Holder mounting bracket	Suffix	Mounting pcs. X416	Mounting pcs. X417	Combination description
L, H, LS, SL, HS, SH	X416	-	1		X416 on one side ＊Note 2)
L, H		W	2		X416 on both sides
		Z	1	1	X416 on left side, X417 on the other side ＊Note 2)
LH, HL		L	1		X416 on L unit side
		H	1		X416 on H unit side
		LZ	1	1	X416 on L unit side, X417 on the other side
		HZ	1	1	X416 on H unit side, X417 on the other side
L, H, LS, SL, HS, SH	X417	-		1	X417 on one side ＊Note 2)
L, H		W		2	X417 on both sides
LH, HL		L		1	X417 on L unit side
		H		1	X417 on H unit side

Note 1) For LS, SL, HS and SH, the stroke adjusting unit is mounted on one side only.
Note 2) The stroke adjusting unit is installed on the left side (or right side in case of SL and SH) at the time of shipment. It can however be moved to the right side (or left side).

Ordering Example

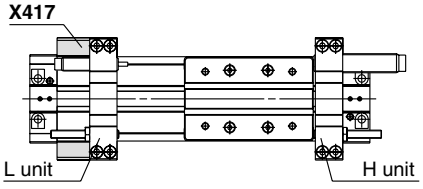
● **L units with one each of X416 and X417**

MY3B25-300L-X416Z



● **L and H units, where X417 is mounted on L unit only and nothing on H unit**

MY3B25-300LH-X417L



● **How to order single pieces of stroke adjusting unit**

MY3B-A16L1 – X417

- **Holder mounting bracket**

X416	Holder mounting bracket 1
X417	Holder mounting bracket 2

- **Stroke adjusting unit model**

Note) Refer to the options table of "How to Order" for each series.
MY3B → Page 9, **MY3M** → Page 23

Example) MY3B-A25L1-X416
(Left side L unit of MY3B25 and X416 bracket)

Ordering Example

● **How to order single pieces of holder mounting bracket**

MY3 B – A 25 – X417 N

- **Holder mounting bracket**

X416	Holder mounting bracket 1
X417	Holder mounting bracket 2

- **Type/Bore size**

		16	25	40	63
B	Basic standard type	●	●	●	●
M	Slide bearing type	●	●	●	●

Note) The holder mounting bracket can be commonly used on the L and H units as well as the left and right sides.

Example) MY3B-A25-X416N
(X416 bracket for L and H units of MY3B)

4 Copper-free 20-

For copper-free applications

20-MY3 M Bore size □ – Stroke □ – Auto switch Symbol

- **Stroke adjusting unit**
  (＊ MY3B and MY3M only)
- **Port thread type**
- **Type/Bore size**

		16	25	40	63
A	Basic short type	●	●	●	●
B	Basic standard type	●	●	●	●
M	Slide bearing type	●	●	●	●

Example) 20-MY3M25-300-M9B

Series MY3
Safety Instructions

These safety instructions are intended to prevent a hazardous situation and/or equipment damage. These instructions indicate the level of potential hazard by labels of **"Caution", "Warning"** or **"Danger"**. To ensure safety, be sure to observe ISO 4414 Note 1), JIS B 8370 Note 2) and other safety practices.

■ Explanation of the Labels

Labels	Explanation of the labels
⚠ **Danger**	In extreme conditions, there is a possible result of serious injury or loss of life.
⚠ **Warning**	Operator error could result in serious injury or loss of life.
⚠ **Caution**	Operator error could result in injury Note 3) or equipment damage. Note 4)

Note 1) ISO 4414: Pneumatic fluid power – General rules relating to systems
Note 2) JIS B 8370: General Rules for Pneumatic Equipment
Note 3) Injury indicates light wounds, burns and electrical shocks that do not require hospitalisation or hospital visits for long-term medical treatment.
Note 4) Equipment damage refers to extensive damage to the equipment and surrounding devices.

■ Selection/Handling/Applications

1. The compatibility of the pneumatic equipment is the responsibility of the person who designs the pneumatic system or decides its specifications.
Since the products specified here are used in various operating conditions, their compatibility for the specific pneumatic system must be based on specifications or post analysis and/or tests to meet the specific requirements. The expected performance and safety assurance are the responsibility of the person who has determined the compatibility of the system. This person should continuously review the suitability of all items specified, referring to the latest catalogue information with a view to giving due consideration to any possibility of equipment failure when configuring a system.

2. Only trained personnel should operate pneumatically operated machinery and equipment.
Compressed air can be dangerous if handled incorrectly. Assembly, handling or repair of the systems using pneumatic equipment should be performed by trained and experienced operators. (Understanding JIS B 8370 General Rules for Pneumatic Equipment, and other safety rules is included.)

3. Do not service the machinery/equipment or attempt to remove components until safety is confirmed.
1. Inspection and maintenance of the machinery/equipment should only be performed once measures to prevent falling or runaway of the driven objects have been confirmed.
2. If the equipment must be removed, confirm that the safety process as mentioned above. Turn off the supply pressure for the equipment and exhaust all residual compressed air in the system, and release all the energy (liquid pressure, spring, condenser, gravity).
3. Before the machinery/equipment is restarted, take measures to prevent quick extension of a cylinder piston rod, etc.

4. If the equipment will be used in the following conditions or environment, please contact SMC first and be sure to take all necessary safety precautions.
1. Conditions and environments beyond the given specifications, or if product is used outdoors.
2. Installation on equipment in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverages, recreation equipment, emergency stop circuits, clutch and brake circuits in press applications, or safety equipment.
3. An application which has the possibility of having negative effects on people, property, requiring special safety analysis.
4. If the products are used in an interlock circuit, prepare a double interlock style circuit with a mechanical protection function for the prevention of a breakdown. And, examine the devices periodically if they function normally or not.

■ Exemption from Liability

1. SMC, its officers and employees shall be exempted from liability for any loss or damage arising out of earthquakes or fire, action by a third person, accidents, customer error with or without intention, product misuse, and any other damages caused by abnormal operating conditions.

2. SMC, its officers and employees shall be exempted from liability for any direct or indirect loss or damage, including consequential loss or damage, loss of profits, or loss of chance, claims, demands, proceedings, costs, expenses, awards, judgments and any other liability whatsoever including legal costs and expenses, which may be suffered or incurred, whether in tort (including negligence), contract, breach of statutory duty, equity or otherwise.

3. SMC is exempted from liability for any damages caused by operations not contained in the catalogues and/or instruction manuals, and operations outside of the specification range.

4. SMC is exempted from liability for any loss or damage whatsoever caused by malfunctions of its products when combined with other devices or software.

Series MY3
Auto Switch Precautions 1

Be sure to read this before handling.

Design and Selection

⚠Warning

1. Confirm the specifications.

Read the specifications carefully and use the product appropriately. The product may be damaged or malfunction if it is used outside of its specification range (e.g. load current, voltage, temperature or impact, etc.).
The warranty provided with this product is invalidated if any damage is caused through usage outside of our recommended operational specifications.

2. Pay attention to the length of time that a switch is on at an intermediate stroke position.

When an auto switch is placed at an intermediate position of the stroke and a load connected to the auto switch is driven at the time the slide table passes, the auto switch will operate. However, if the speed is too great, the operating time will be shortened and the load may not operate properly. The maximum detectable piston speed is:

$$V\ (mm/s) = \frac{\text{Auto switch operating range (mm)}}{\text{Load operating time (ms)}} \times 1000$$

3. Keep wiring as short as possible.

<Reed switch>

As the length of the wiring to a load gets longer, the rush current at the time the switch is turned ON becomes greater, which may shorten the product's service life. (The switch will stay ON all the time.)
Use a contact protection box when the wire length is 5 m or longer.

<Solid state switch>

Although the wire length should not affect switch function, use a wire that is 100 m or shorter.

4. Do not use a load that generates surge voltage.

<Reed switch>

If driving a load such as a relay which generates a surge voltage, use a contact protection box.

<Solid state switch>

Although a zener diode for surge protection is connected at the output side of a solid state switch, damage may still occur if a surge is applied repeatedly. When directly driving a load which generates a surge, such as a relay or solenoid valve, use a switch with a built-in surge absorbing element.

5. Cautions for use in an interlock circuit

When an auto switch is used for an interlock signal requiring high reliability, devise a double interlock system to safeguard against malfunctions. The double interlock system should provide a mechanical protection function or use another switch (sensor) together with the auto switch. Also, perform periodic inspection and confirm proper operation.

6. Prohibition of dis-assembly, remodel (including any printed circuit board changes) and repair

Do not take the product apart, to either remodel (including any printed circuit board changes) or make repairs.

⚠Caution

1. Use caution when multiple cylinders (actuators) are used and close to each other.

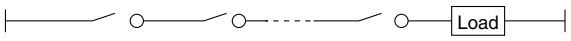
When two or more auto switch cylinders (actuators) are lined up in close proximity to each other, magnetic field interference may cause the switches to malfunction. Maintain a minimum cylinder separation of 40 mm. (When the allowable interval is specified for each cylinder series, use the indicated value.)

2. Take precautions for the internal voltage drop of the switch.

<Reed switch>

1) Switches with an indicator light (Except D-A96, A96V)

- If auto switches are connected in series as shown below, take note that there will be a large voltage drop because of internal resistance from the light emitting diodes. (Refer to internal voltage drop in the auto switch specifications.)
  [The voltage drop will be "n" times larger when "n" auto switches are connected.]
  Even though an auto switch operates normally, the load may not operate.



- Similarly, when operating below a specified voltage, it is possible that the load may be ineffective even though the auto switch function is normal. Therefore, the formula below should be satisfied after confirming the minimum operating voltage of the load.

$$\text{Supply voltage} - \text{Internal voltage drop of switch} > \text{Minimum operating voltage of load}$$

2) If the internal resistance of a light emitting diode causes a problem, select a switch without an indicator light (Models D-A90, A90V).

<Solid state switch>

3) Generally, the internal voltage drop will be greater with a 2-wire solid state switch than with a reed switch. Take the same precautions as in item (1) as mentioned above.
Also, note that a 12 VDC relay is not applicable.

Series MY3
Auto Switch Precautions 2

Be sure to read this before handling.

Design and Selection

⚠Caution

3. Pay attention to leakage current.

<Solid state switch>

With a 2-wire solid state switch, current (leakage current) flows to the load to operate the internal circuit even when in the OFF state.

Current to operate load (Input OFF signal of controller) > Leakage current

If the condition given in the above formula is not met, internal circuit will not reset correctly (stays ON). Use a 3-wire switch if this specification cannot be satisfied.
Moreover, leakage current flow to the load will be "n" times larger when "n" auto switches are connected in parallel.

4. Provide enough space for maintenance.

When designing an application, be sure to allow sufficient clearance for maintenance and inspections.

Mounting and Adjustment

⚠Warning

1. Instruction manual

Install the products and operate them only after reading the instruction manual carefully and understanding its contents. Also keep the manual where it can be referred to as necessary.

2. Do not drop or bump.

Do not drop, bump or apply excessive impacts (300 m/s^2 or more for reed switches and 1000 m/s^2 or more for solid state switches) while handling. Although the body of the switch may not be damaged, the inside of the switch could be damaged and cause a malfunction.

3. Mount switches using the proper tightening torque.

When a switch is tightened beyond the range of tightening torque, the mounting screws, or switch may be damaged.
On the other hand, tightening below torque range may allow the switch to slip out of position. (Refer to switch mounting for each series regarding switch mounting, moving, and fastening torque, etc.

4. Mount a switch at the centre of the operating range.

Adjust the mounting position of an auto switch, so that the piston stops at the centre of the operating range (the range in which a switch is stayed ON). (The mounting positions shown in the catalogue indicate the optimum position at stroke end.) If mounted at the end of the operating range (around the borderline of ON and OFF), operation will be unstable.

<D-M9□>

When the D-M9 auto switch is used to replace old series auto switch, it may not activate depending on operating condition because of its shorter operating range.

Such as

- Application where the stop position of actuator may vary and exceed the operating range of the auto switch, for example, pushing, pressing, clamping operation, etc.
- Application where the auto switch is used for detecting an intermediate stop position of the actuator. (In this case the detecting time will be reduced.)

In these applications, set the auto switch to the centre of the required detecting range.

Mounting and Adjustment

⚠Warning

5. Ensure sufficient clearance for maintenance activities.

When designing an application, be sure to allow sufficient clearance for maintenance and inspections.

⚠Caution

1. Do not carry a cylinder by the auto switch lead wires.

Never carry a cylinder by its lead wires. This may not only cause broken lead wires, but it may cause internal elements of the switch to be damaged by the stress.

2. Fix the switch with appropriate screw installed on the switch body. If using other screws, switch may be damaged.

Wiring

⚠Warning

1. Confirm proper insulation of wiring.

Be certain that there is no faulty wiring insulation (such as contact with other circuits, ground fault, improper insulation between terminals, etc.). Damage may occur due to excess current flow into a switch.

2. Do not wire in conjunction with power lines or high voltage lines.

Wire separately from power lines or high voltage lines, avoiding parallel wiring or wiring in the same conduit with these lines. Control circuits containing auto switches may malfunction due to noise from these other lines.

⚠Caution

1. Avoid repeatedly bending or stretching lead wires.

Broken lead wires will result from repeatedly applying bending stress or stretching force to the lead wires.

2. Be sure to connect the load before power is applied.

<2-wire type>

If the power is turned ON when an auto switch is not connected to a load, the switch will be instantly damaged because of excess current.

3. Do not allow short circuit of loads.

<Reed switch>

If the power is turned ON with a load in a short-circuited condition, the switch will be instantly damaged because of excess current flow into the switch.

<Solid state switch>

The switches do not have built-in short circuit protection circuits. If loads are short circuited, the switches will be instantly damaged, as in the case of reed switches.
Take special care to avoid reverse wiring with the brown power supply line and the black output line on 3-wire type switches.

Back page 3

Series MY3
Auto Switch Precautions 3

Be sure to read this before handling.

Wiring

⚠Caution

4. Avoid incorrect wiring.

<Reed switch>

A 24 VDC switch with indicator light has polarity. The brown lead wire is (+), and the blue lead wire is (–).

1) If connections are reversed, the switch will still operate, but the light emitting diode will not be illuminated.
   Also note that a current greater than the maximum specified one will damage a light emitting diode and make it inoperable.
   Applicable models: D-A93, A93V

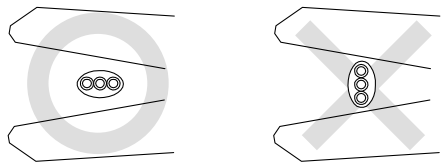
<Solid state switch>

1) Even if connections are reversed on a 2-wire type switch, the switch will not be damaged because it is protected by a protection circuit, but it will remain in a normally ON state. But reverse wiring in a load short circuit condition should be avoided to protect the switch from being damaged.
2) Even if power supply line (+) and power supply line (–) power supply line connections are reversed on a 3-wire type switch, the switch will be protected by a protection circuit. However, if the power supply line (+) is connected to the blue wire and the power supply line (–) is connected to the black wire, the switch will be damaged.

<D-M9□>

D-M9□ does not have built-in short circuit protection circuit. Be aware that if the power supply connection is reversed (e.g. (+) power supply wire and (–) power supply wire connection is reversed), the switch will be damaged.

5. When the cable sheath is stripped, confirm the stripping direction. The insulator may be split or damaged depending on the direction. (D-M9□ only)



Recommended Tool

Model name	Model no.
Wire stripper	D-M9N-SWY

∗ Stripper for a round cable (ø2.0) can be used for a 2-wire type cable.

Operating Environment

⚠Warning

1. Never use in an atmosphere of explosive gases.

The construction of the auto switch is not intended to prevent explosion. Never use in an atmosphere with an explosive gas since this may cause a serious explosion.

2. Do not use in an area where a magnetic field is generated.

The auto switch will malfunction or the magnets inside of a cylinder will become demagnetised if used in such an environment. (Please consult with SMC regarding the availability of a magnetic field resistant auto switch.)

3. Do not use in an environment where the auto switch will be continually exposed to water.

The switch satisfies the IEC standard IP67 construction (JIS C 0920: waterproof construction). Nevertheless, it should not be used in applications where it is continually exposed to water splash or spray. This may cause deterioration of the insulation or swelling of the potting resin inside switch causing a malfunction.

4. Do not use in an environment with oil or chemicals.

Please consult with SMC if the auto switch will be used in an environment laden with coolant, cleaning solvent, various oils or chemicals. If the auto switch is used under these conditions for even a short time, it may be adversely effected by a deterioration of the insulation, a malfunction due to swelling of the potting resin, or hardening of the lead wires.

5. Do not use in an environment with temperature cycles.

Please consult with SMC if the switch is used where there are temperature cycles other than normal temperature changes, as they may adversely affected the switch internally.

6. Do not use in an environment where there is excessive impact shock.

<Reed switch>

When excessive impact (300 m/s^2 or more) is applied to a reed switch during operation, the contact point may malfunction and generate a signal momentarily (1 ms or less) or cut off. Please consult with SMC regarding the need to use a solid state switch in a specific environment.

7. Do not use in an area where surges are generated.

<Solid state switch>

When there are units (such as solenoid type lifters, high frequency induction furnaces, motors, etc.) that generate a large amount of surge in the area around a cylinder with a solid state auto switch, their proximity or pressure may cause deterioration or damage to the internal circuit of the switch. Avoid sources of surge generation and crossed lines.

Series MY3
Auto Switch Precautions 4

Be sure to read this before handling.

Operating Environment

⚠Caution

1. Avoid accumulation of iron debris or close contact with magnetic substances.

The auto switches in an actuator may malfunction when a large accumulated amount of machining chips, welding spatter and or magnetically attracted material is located near the auto switch. This failure may be the result of loss magnetic force inside of the actuator.

2. Please consult with SMC concerning water resistance, elasticity of lead wires, usage at welding sites, etc.

3. Do not use in direct sunlight.

4. Do not mount the product in locations where it is exposed to radiant heat.

Maintenance

⚠Warning

1. Perform the following maintenance periodically in order to prevent possible danger due to unexpected auto switch malfunction.

1) Securely tighten switch mounting screws.
If screws become loose or the mounting position is dislocated, retighten them after re-adjusting the mounting position.

2) Confirm that there is no damage to the lead wires.
To prevent faulty insulation, replace switches or repair lead wires, etc., if damage is discovered.

3) Confirm that the green light on the 2-colour display type switch is illuminated.
Confirm that the green LED is turned ON when stopped at the set position. If the red LED is turned ON, when stopped at the set position, the mounting position is not appropriate. Re-adjust the mounting position until the green LED is illuminated.

2. Perform maintenance inspection according to the procedure indicated in the instruction manual.

Improper handling and maintenance may cause damage to human beings and malfunctioning and damage of machinery or equipment to occur.

3. Removal of components, and supply/exhaust of compressed air.

When the equipment is removed, first check measures to prevent dropping of driven objects and run away of the equipment, etc. Then, cut off the supply pressure and electric power, and exhaust all compressed air from the system.
When the machinery is restarted, proceed with caution after confirming measures to prevent a cylinder from lurching.

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Series MY3
Specific Product Precautions 1

Be sure to read this before handling.
For Actuator Precautions, refer to "Precautions for Handling Pneumatic Devices" (M-03-E3A).

Caution on Design

⚠Warning

1. A deceleration circuit or shock absorber may be required.

When a driven object is operated at high speed or the load is heavy, a cylinder's cushion will not be sufficient to absorb the impact. Install a deceleration circuit to reduce the speed before cushioning, or install an external shock absorber to relieve the impact. In cases such as these, the rigidity of the machinery should also be examined.

* The external shock absorber should conform to the conditions on page 7. Use caution because the use of a shock absorber falling short of the recommended conditions may damage the cylinder.

⚠Caution

1. Due to structural differences, fluctuations in the operating speed of mechanically jointed rodless cylinders may be larger than rod type air cylinders.

Please consult with SMC if you require a precise, constant, speed in your application.

Selection

⚠Caution

1. Provide intermediate supports for long stroke cylinders.

Provide intermediate supports for cylinders with long strokes to prevent damage due to deflection of the tube, vibration and external loads.
For detailed information, please refer to "Guide for Using Side Support" on page 15 and 27.

Mounting

⚠Caution

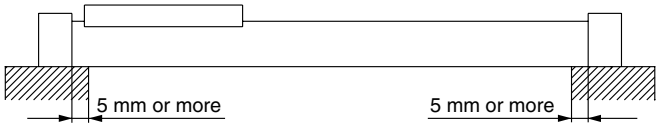
1. Do not apply strong impacts or excessive moment to the slide table (slider).

Do not apply strong impact or excessive moment in mounting the work piece because the slide table (slider) is supported by resin bearings.

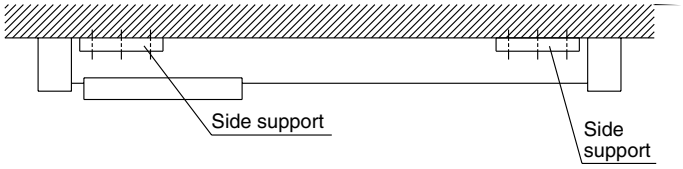
2. Align carefully when connecting to a load having an external guide mechanism.

A mechanically jointed rodless cylinder can be used with a direct load within the allowable range for each guide type, however, careful alignment is required when connecting to a load having an external guide mechanism. The longer the stroke, the larger the deflection of the axis centre becomes. Therefore, adopt an appropriate connection method (floating mechanism) to absorb the difference. For the MY3A and MY3B series, dedicated floating mechanism brackets are available (page 16).

3. At each end of the cylinder, secure a mounting surface with a 5 mm or longer area that contacts the lower side of the cylinder.



4. If the cylinder is mounted on the ceiling or wall under the condition where high load factors or impacts are expected, use side supports, in addition to the fixing bolts on the head cover, to support both ends of the cylinder tube.



Operating Environment

⚠Warning

1. Avoid use in environments where a cylinder will come in contact with coolants, cutting oil, droplet of water, adhesive matter, or dust, etc. Also avoid operation with compressed air that contains drainage or foreign matter, etc.

- Foreign matter or liquids on the cylinder's interior or exterior can wash out the lubricating grease, which can lead to deterioration and damage of dust seal band and seal materials, causing a danger of malfunction.
  When operating in locations with exposure to water and oil drops, or in dusty locations, provide protection such as a cover to prevent direct contact with the cylinder, or mount so that the dust seal band surface faces downward, and operate with clean compressed air.

Series MY3
Specific Product Precautions 2

Be sure to read this before handling.
For Actuator Precautions, refer to "Precautions for Handling Pneumatic Devices" (M-03-E3A).

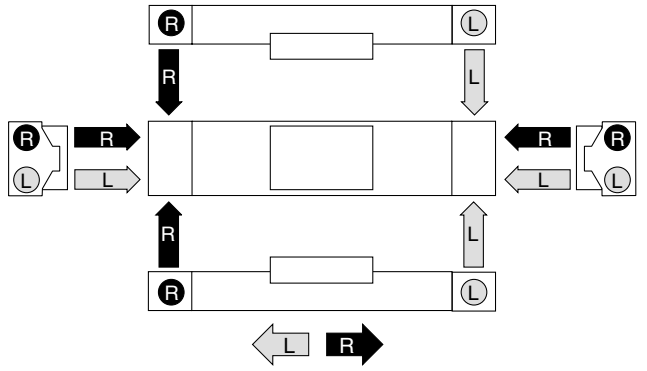
Maintenance

⚠Caution

Centralised Piping Port Variations

• Head cover piping connection can be freely selected to best suit different piping conditions.

Port variations



Slide table operating direction

Handling

⚠Caution

1. Use caution not to have your hands caught in the unit.

When using a cylinder with stroke adjusting unit, the space between the slide table (slider) and the stroke adjusting unit is very narrow. Care should be taken to avoid the danger of hands being caught in this small space. Install a protective cover to prevent the risk of accidents to the human body.

2. Do not use the cylinder when the pressure inside the cylinder will turn to negative pressure.

In operating conditions where negative pressure is generated inside a cylinder — by the external force or inertial force, etc.— be careful as the seal may distort or detach, resulting in air leakage.

3. The stroke adjusting unit may interfere with the mounting bolt when mounting the cylinder on the equipment.

Loosen the unit fixing bolt and remove the stroke adjusting unit before mounting the cylinder. After fixing the cylinder, move the stroke adjusting unit back to the desired location and tighten the unit fixing bolt.
Use caution not to overtighten the fixing bolts.
(Refer to back page 8, "MY3B/MY3M Stroke Adjusting Unit Tightening Torque for Fixing Bolts".)

4. Use an external guide for the MY3B stroke adjusting unit.

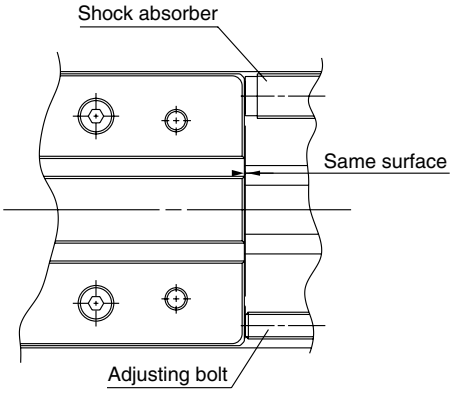
The stroke adjusting unit must be used on condition that an external guide is used. If a stroke adjusting unit is used where the cylinder is used alone, the collision reaction may cause damage to the cylinder.

Handling

⚠Caution

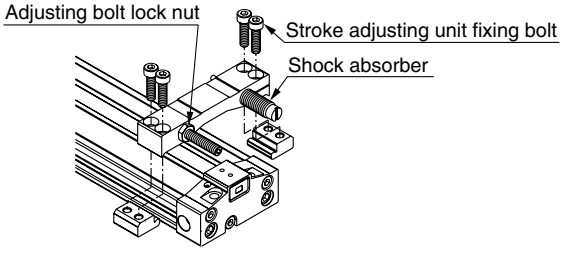
5. Conduct stroke adjustment with an adjusting bolt as follows:

The adjusting bolt should be secured against the same surface as the shock absorber after stroke adjustment.
If the stopper surface of the shock absorber and the end surface of the adjusting bolt are not on the same level, it may result in an unstable stop position of the slide table or reduced durability.

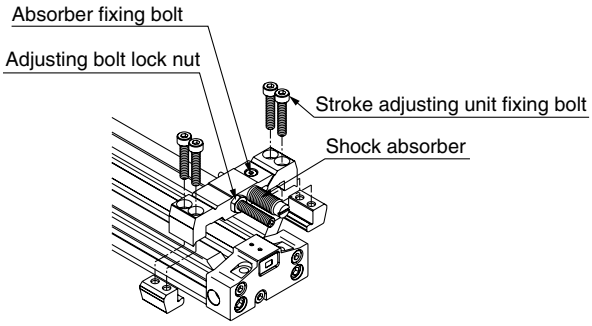


6. Securing the unit body

<MY3B>



<MY3M>



Tighten the four unit fixing bolts equally to secure the unit body.

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Series MY3
Specific Product Precautions 3

Be sure to read this before handling.
For Actuator Precautions, refer to "Precautions for Handling Pneumatic Devices" (M-03-E3A).

Handling

⚠ Caution

7. Do not fix and use the stroke adjusting unit at an intermediate position (MY3B/MY3M).

If the stroke adjusting unit is fixed at an intermediate position, an error may result depending on the collision energy. In that case, the use of the holder mounting bracket for adjustment is recommended. It is provided with the "-X416" or "-X417" made-to-order specification.
(Refer to "MY3B/MY3M Stroke Adjusting Unit Tightening Torque for Fixing Bolts.")
If the stroke adjusting unit is used at an intermediate position, the energy absorption capacity may be different. Refer to the maximum absorbed energy on page 6 and 21 and operate within the allowable absorption energy.

<Stroke adjustment of the adjusting bolt>

Loosen the lock nut for the adjusting bolt, adjust the stroke on the head cover side with a hexagon wrench, and secure with a lock nut.

<Stroke adjustment of the shock absorber: MY3B>

Loosen the two unit fixing bolts on the shock absorber side and rotate the shock absorber for stroke adjustment. Tighten the unit fixing bolts equally to secure the shock absorber. Use caution not to overtighten the fixing bolts.
(Refer to "MY3B/MY3M Stroke Adjusting Unit Tightening Torque for Fixing Bolts.")

<Stroke adjustment of the shock absorber: MY3M>

Loosen the fixing bolt for the shock absorber. Rotate the shock absorber and adjust it. Then, tighten the fixing bolt for the shock absorber and secure the shock absorber. Additionally, please be careful that the fixing bolt should not be tightened excessively.
(Refer to "MY3M Shock Absorber Tightening Torque for Fixing Bolts".)

MY3B/MY3M Stroke Adjusting Unit Tightening Torque for Fixing Bolts

Unit: N•m

Bore size (mm)	Unit	Tightening torque
16	L	0.6
	H	
25	L	3.0
	H	
40	L	12
	H	
63	L	24
	H	

MY3M Shock Absorber Tightening Torque for Fixing Bolts

Unit: N•m

Bore size (mm)	Unit	Tightening torque
16	L	0.6
	H	
25	L	1.5
	H	
40	L	3.0
	H	
63	L	5.0
	H	

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